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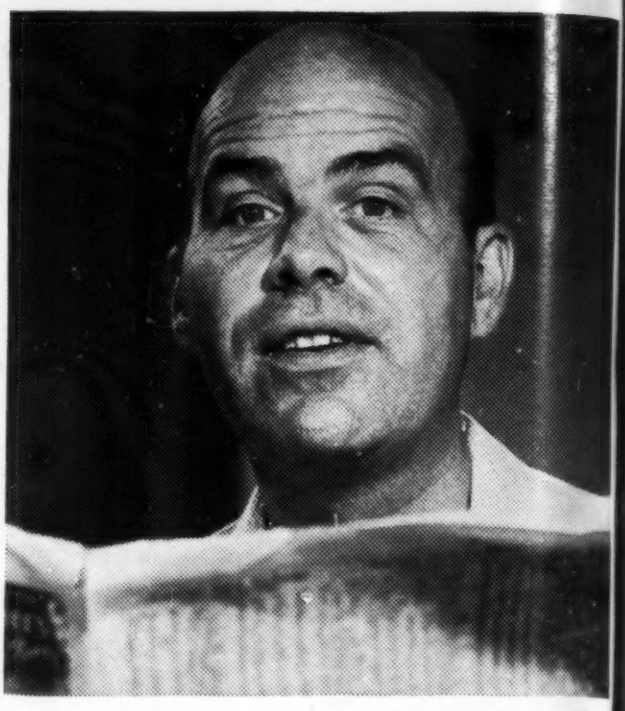

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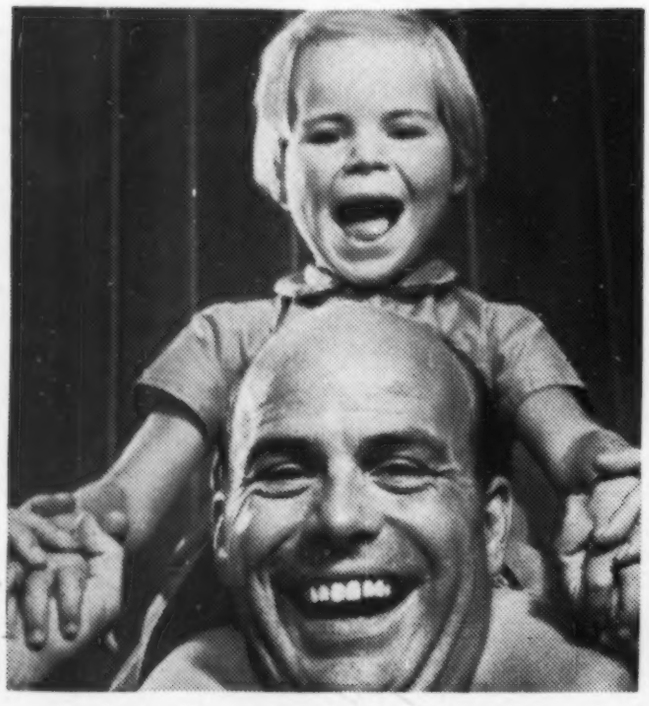

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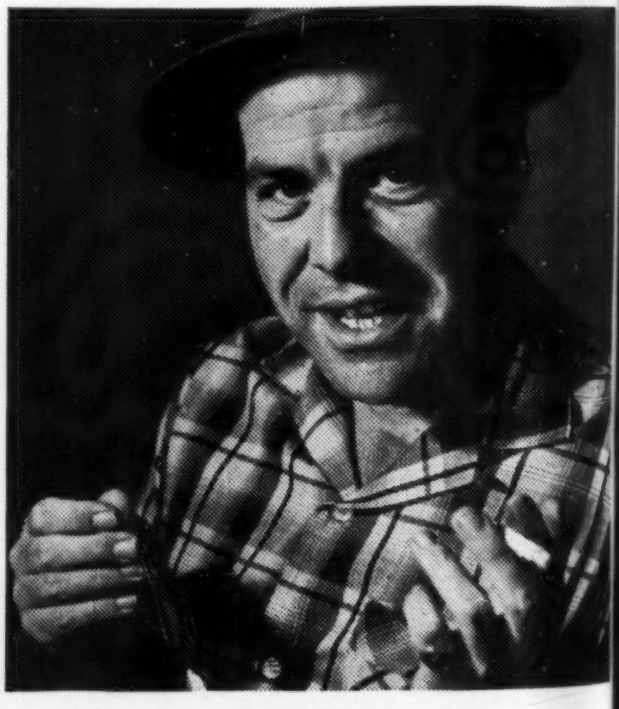

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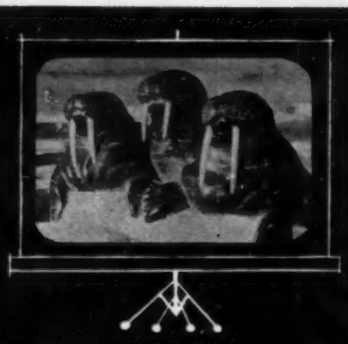

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CANADIAN GEOGRAPHICAL JOURNAL

Editor - WILLIAM J. MEGILL

CONTENTS

MARCH 1961 ✦ VOLUME LXII ✦ NUMBER 3

COVER SUBJECT:—*The icebreaker* d'Iberville *passes an iceberg in Lancaster Sound along the northern coast of Baffin Island.* Department of Transport

✦

The articles in this Journal are indexed in the *International Index to Periodicals* and in the *Canadian Index*.

The British standard of spelling is adopted substantially as used by the Government of Canada and taught in most Canadian schools, the precise authority being the Concise Oxford Dictionary, fourth edition, 1951.

Financial assistance from the Canada Council towards publication of the *Canadian Geographical Journal* is gratefully acknowledged. The fact that a grant has been made does not imply, however, that the Canada Council endorses or is responsible for the statements or views expressed in the Journal.

Address all communications regarding change of address, non-delivery of Journal, etc., to the Head Office, 54 Park Avenue, Ottawa 4, Canada, giving old and new address. On all memberships, the expiry date will be printed on wrapper. This will constitute a receipt for subscription.

Member Audit Bureau of Circulations

Head Office: 54 Park Avenue, Ottawa 4
(Tel. CE. 6-7493)

Printing Office: Gazette Printing Company (Limited),
1000 St. Antoine St., Montreal 3.

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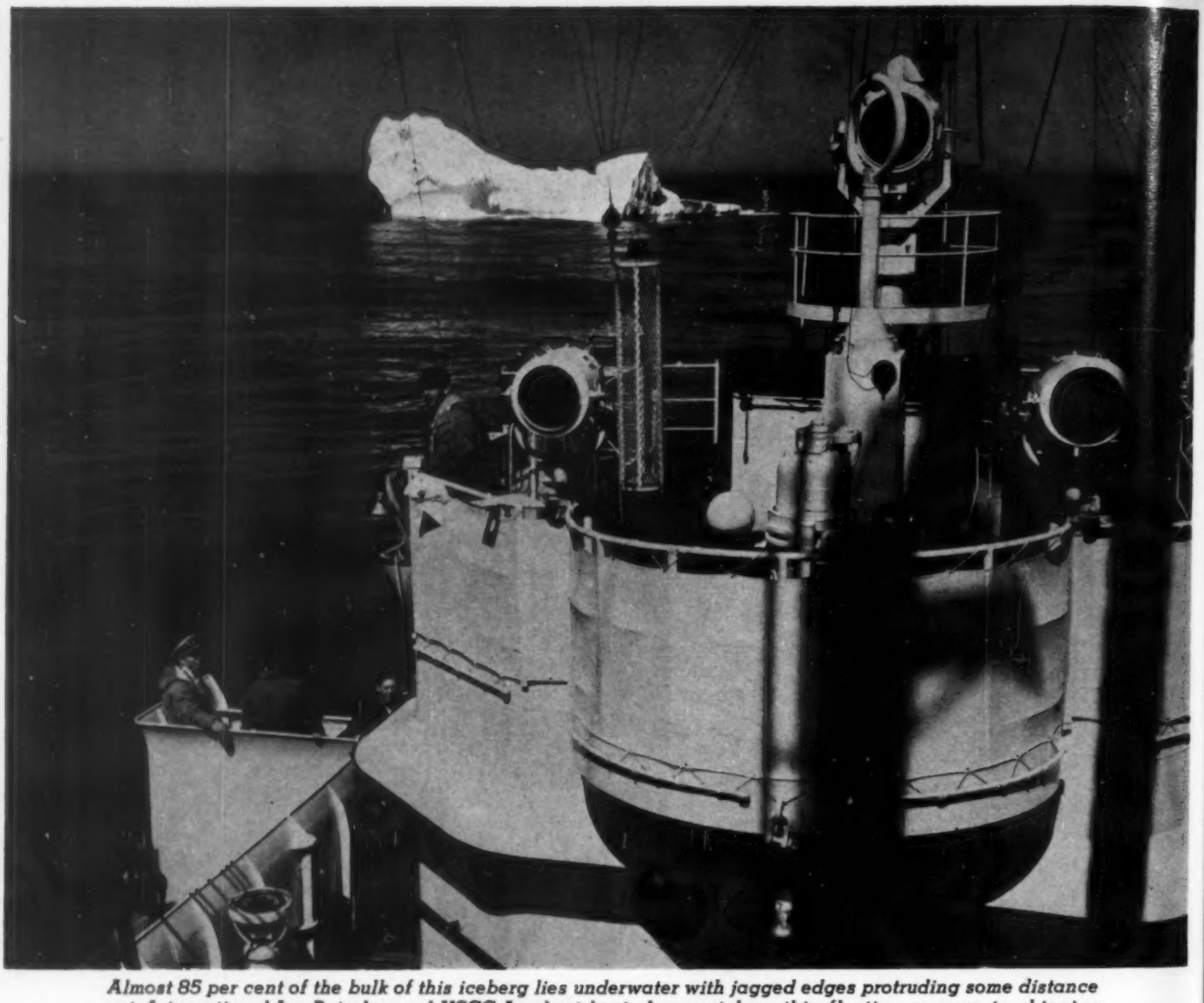


Almost 85 per cent of the bulk of this iceberg lies underwater with jagged edges protruding some distance out. International Ice Patrol vessel USCG Acushnet *kept close watch on this floating menace to shipping until it melted in the warm waters of the Gulf Stream.*

International Ice Patrol

by W. H. VAN ALLEN

Photographs by the United States Coast Guard except where credited.

ICE CONDITIONS in the North Atlantic and in Canadian waters were below the forty-year average in 1960 but in the preceding year they were far above normal. The International Ice Patrol in the North Atlantic, conducted by the United States Coast Guard Service on behalf of sixteen contributing countries, reported that 243 icebergs were sighted below the 48th parallel in 1960 as compared with 700 reported south of that latitude in 1959. The average for the forty years that the International Ice Patrol has been in operation shows that sizeable icebergs which break off or are "calved", to use Ice Patrol terminology, from the West Greenland ice cap number between 7,500 and 8,000 each year. Some 400 or more drift south of latitude 48 degrees, off Newfoundland, and approximately 35 reach as far south as latitude 43 which lies one degree north of Boston.

As an indication of the need for constant vigilance by the International Ice Patrol, the United States Coast Guard Service reports that within the period of surface patrol in 1959, from April 20 to July 11, ice existed in the effective U.S.-European ship-

ping tracks[1] during a total of 26 days and that another ten days ice lay within 30 miles of the track in current use. The Canadian routes were under constant threat. Numerous icebergs in the vicinity of Cape Race drifted westward as late as June and some entered Placentia Bay. This was a most unusual occurrence. Field ice extended as far south as Sable Island.

The International Ice Patrol reported that, concurrent with 1959 being an exceptionally heavy ice year, the St. Lawrence Seaway opened to traffic in late April of that year and the volume of shipping reached high proportions. Many ships continued to use Track "E" until mid-June, staying south of latitude 46 degrees.

History of the International Ice Patrol

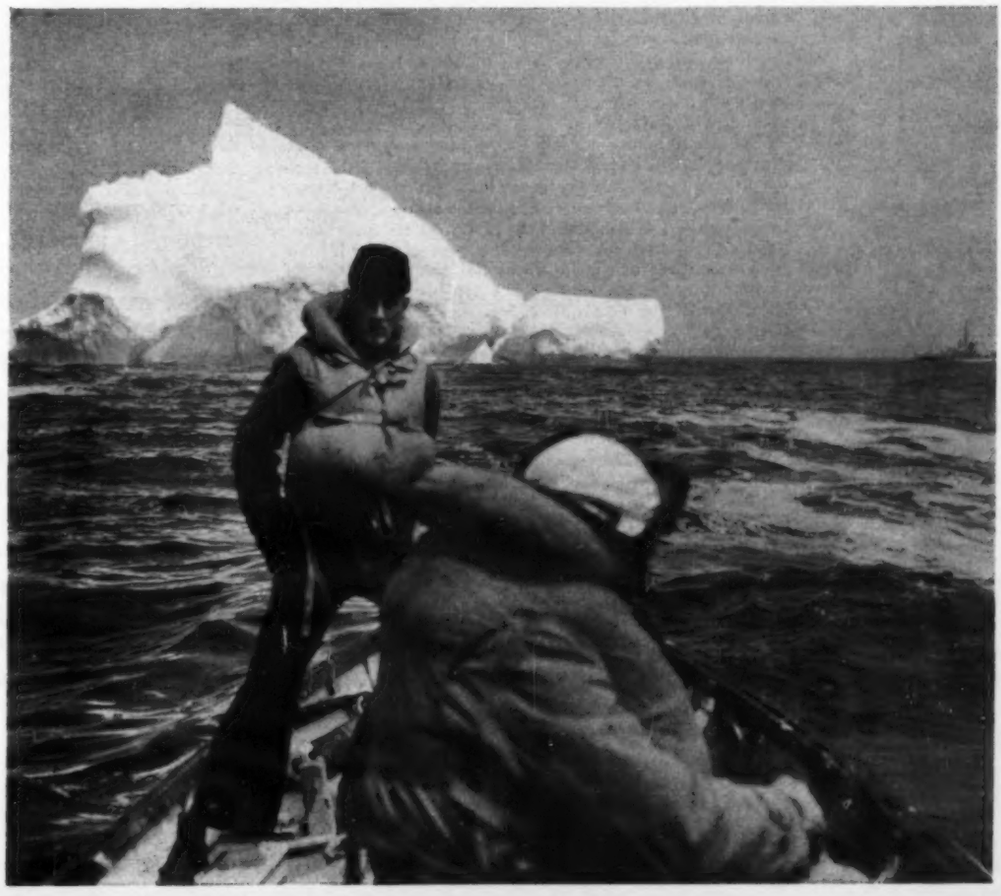
The International Ice Patrol came into being as a result of the sinking of the *Titanic* in April, 1912. Immediately after the sinking of the luxury liner, the United States placed two navy scout cruisers on patrol of the ice-menaced shipping lanes and in 1913 the patrol was undertaken by the United States Coast Guard cutters *Seneca* and *Miami*. That same year, the British Board of Trade and various British steamship companies chartered and fitted the steam trawler *Scotia* to carry out weather and ice information service off the coast of Nova Scotia. The *Scotia*, the *Seneca* and the *Miami* co-operated in the dissemination of ice information to passing vessels.

At the First International Conference on the Safety of Life at Sea, convened in London late in 1913, careful consideration was given to the question of patrolling the ice regions. Resulting from the Conference, a convention was signed by representatives of the various maritime powers of the world, providing for the inauguration of an international derelict-destruction, ice observation and ice patrol service.

The Government of the United States was invited to undertake the operation of this triple service, the expenses to be defrayed by the thirteen maritime powers then interested in trans-Atlantic navigation. At the request of Great Britain, on behalf of the several powers interested, the United States also undertook the patrolling of the ice areas in the 1914 season without waiting for official ratification of the convention later that year.

The Second International Conference on the Safety of Life at Sea was convened in London in 1929 with eighteen nations par-

[1]As far back as 1875, the Cunard Line adopted a system of "Tracks" across the Atlantic due to frequent mishaps caused by collisions with icebergs, the southern ones being laid south of the normal ice limit. The added safety of these precautions caused other large companies to join with the Cunard Line in adopting, in 1898, the present North Atlantic Track Agreement.



A life boat from the USCG Androscoggin *sets out to investigate at close quarters an iceberg 500 feet long and with 200 feet showing above water.*

ticipating. The Third Conference was held in 1948 when the convention was revised to incorporate advances in nautical science and improved techniques developed in World War II. In 1956, a new agreement was signed by the participating countries to provide for annual adjustment of each country's share of the cost to conform with changes in tonnage.

The Fourth International Conference on the Safety of Life at Sea, held in London in May, 1960, made no major changes in the Ice Patrol Services. This Conference was convened by the Intergovernmental Maritime Consultative Organization, the Specialized Agency of the United Nations responsible for maritime matters, which came into being in 1959 and which has since taken over from the Government of the United Kingdom the duties of Bureau Power for the convention.

Canada has been a signatory of each convention and agreement with respect to the International Ice Patrol. As a result of the First Conference, the Committee of the Privy Council of Canada passed P.C. 372, which was approved by His Royal Highness the Duke of Connaught on the 9th of February, 1914. This historic document reads as follows:

> The Committee of the Privy Council have had before them a report, dated 2nd February, 1914, from the Secretary of State for External Affairs, upon a despatch from the Secretary of State for the Colonies to your Royal Highness, dated 24th January, 1914, on the subject of the establishment under Articles 6 and 7 of the Convention for the Safety of Life at Sea of the International service of two vessels in the North Atlantic for the purpose of ice observation, ice patrol and derelict destruction.
>
> The Committee, on the recommendation of the Secretary of State for External Affairs, advise that Your Royal Highness may be pleased to inform the Right Honourable the Secretary of State for the Colonies that the Canadian Government is prepared to contribute its quota of two per cent of the cost of establishing such a service on the international basis, pending its permanent establishment on the 1st July, 1915, under the terms of the Convention for the Safety of Life at Sea.
>
> All of which is respectfully submitted for approval.
>
> (signed) Clerk of the Privy Council.

Canada's share of costs, based on the volume of Canadian registered shipping using the North Atlantic shipping routes, is small but her contributions in services are considerable. This now includes information on ice conditions in the St. Lawrence River and Gulf during the late winter and early spring; conditions in the Hudson Strait, Hudson Bay, and Foxe Basin and Channel in early summer; and iceberg and field ice in the vicinity of the Queen Elizabeth archipelago and in Western Arctic waters during mid-summer.

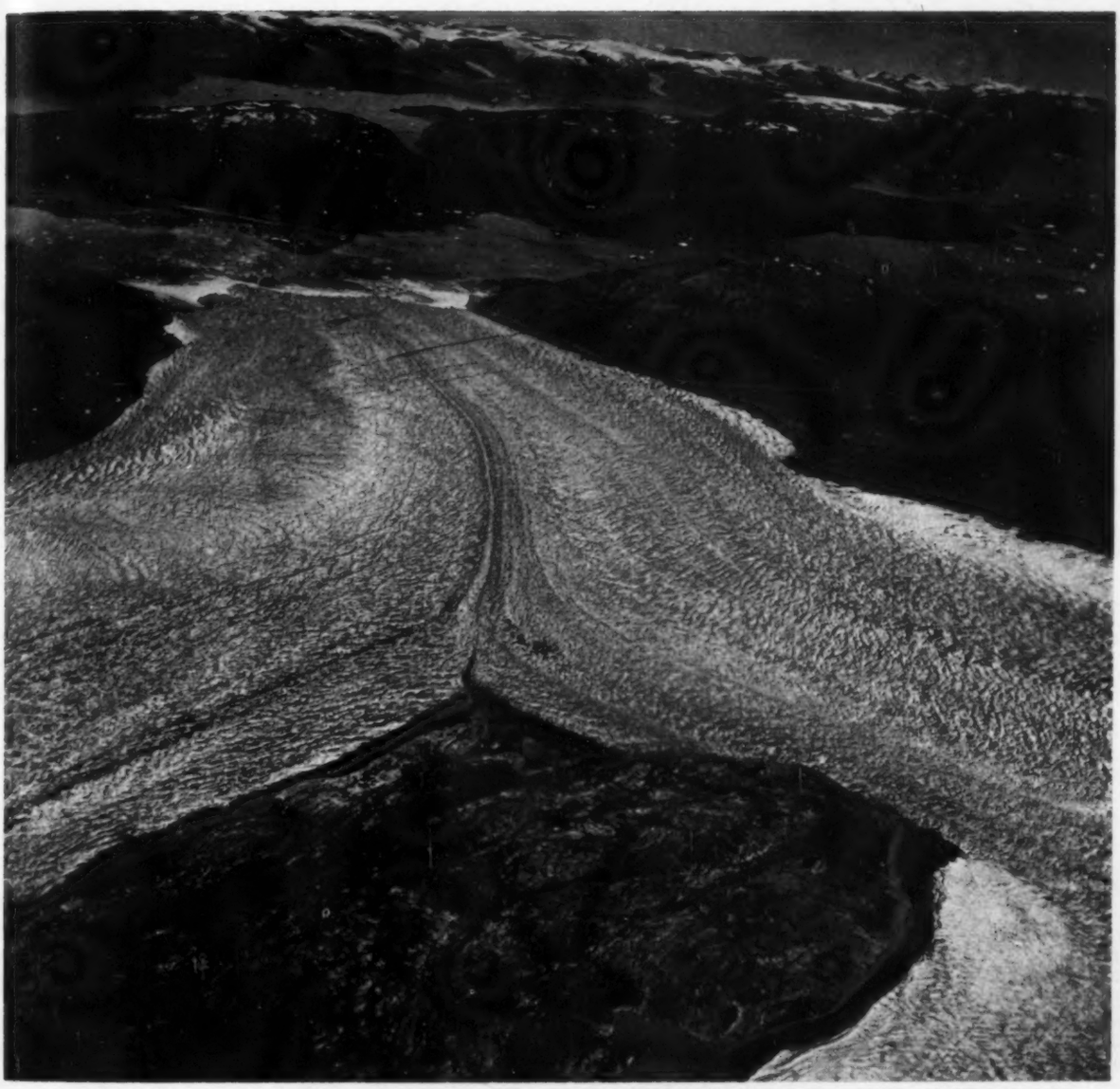
In its report of 1959 operations, the United States Coast Guard Service paid tribute to the aerial ice reconnaissance and ice advisory services carried out by the Canadian Meteorological Services in the Gulf of St. Lawrence and adjacent areas. The report says: ". . . special arrangements with the Canadian Ice Central at Halifax facilitated the rapid exchange of pertinent ice information to provide the most widespread service possible to shipping."

Canada has taken an active part in the various Conferences on the Safety of Life at Sea and has given every assistance possible to the International Ice Patrol. Total cost for maintaining this international service in 1959 was $742,191. with sixteen nations contributing towards its operations. They included Belgium, Canada, Denmark, France, Greece, Italy, the Netherlands, Norway, Sweden, the United Kingdom, the United States, Spain, West Germany, Liberia, Panama and Japan.

Origin of Icebergs

Greenland produces nearly all the icebergs that infest, with varying intensity, the shipping lanes of the North Atlantic during spring and early summer every year. The icebergs are sizeable pieces which have broken from the ice cap covering most of Greenland. There are approximately a hundred tidewater glaciers along the west coast of Greenland, with twenty of them being the principal iceberg producers. Growlers are smaller pieces of ice about the size of a grand piano, many of them having broken off from icebergs. Field ice or pack ice is of comparatively shallow draft but exposes tremendous surface areas.

Icebergs that are liberated into the coastal waters and fiords of West Greenland travel approximately 3,000 miles before they reach the Grand Banks. Many icebergs have been known to travel this distance in eleven months, as their drift averages around ten miles per day, although they have been known to drift at the rate of thirty and forty miles per day for six-day periods when ocean



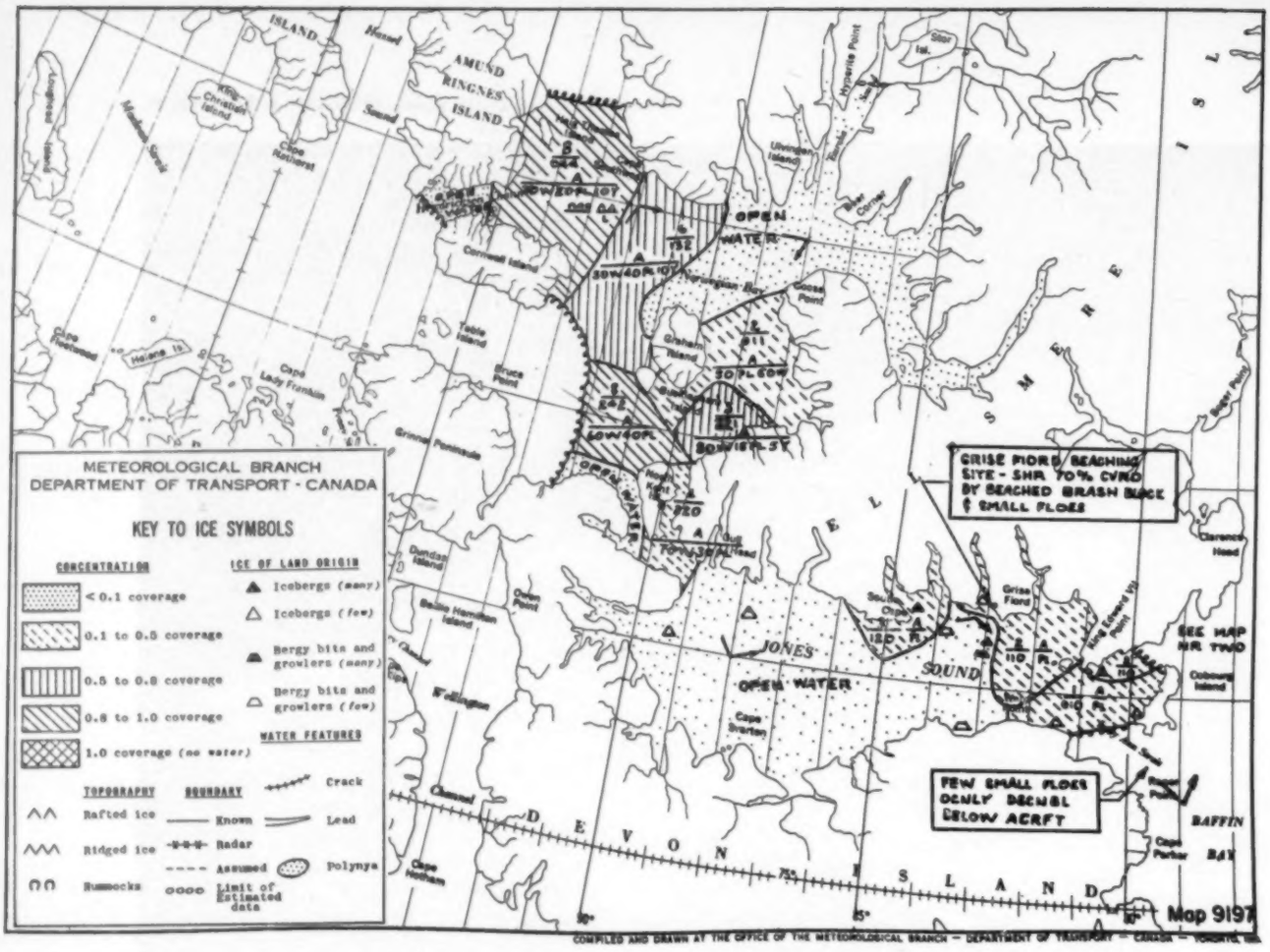
Two West Greenland glaciers unite to push their way to a distant fjord where sections of the glacier will break off as icebergs with the spring break-up. Under tremendous pressure of the ice-cap, glaciers move at a rate of as much as fifty feet a year.

currents and wind were favourable. On the other hand, some icebergs take over two years to cover that distance. They usually spend their first winter in the vicinity of Melville Bay, their second winter in the neighbourhood of Cape Dyer, and reach the Grand Banks during the following spring or summer.

In Canadian Arctic waters, about forty per cent of Ellesmere Island is covered by an ice cap with an outlet to the sea on the northern end of the island. It is believed that when this shelf breaks off, it forms ice islands. These are tabular icebergs whose extent is measured in miles. Ice islands have been estimated up to a few hundred feet thick and from twenty to forty miles across. A few of the remaining islands of the Queen Elizabeth archipelago have ice caps but they are of no importance in the formation of icebergs.

Collisions with Icebergs

Prior to the turn of the century, there were a great number of ship casualties in the North Atlantic as a result of collisions with icebergs and growlers or of getting trapped in field ice. In those days of slow steamers, most of the vessels took a course directly across the



Ice chart showing conditions between Devon, Amund Ringnes and Ellesmere Islands in September 1960. These frigid waters pass through Lancaster Sound to help form the Labrador Current.

An aerial photograph of thousands of icebergs and "growlers" recently "calved" from glaciers in West Greenland. Many of these will disintegrate during the 3,000-mile trip to the sea-lanes of the North Atlantic.

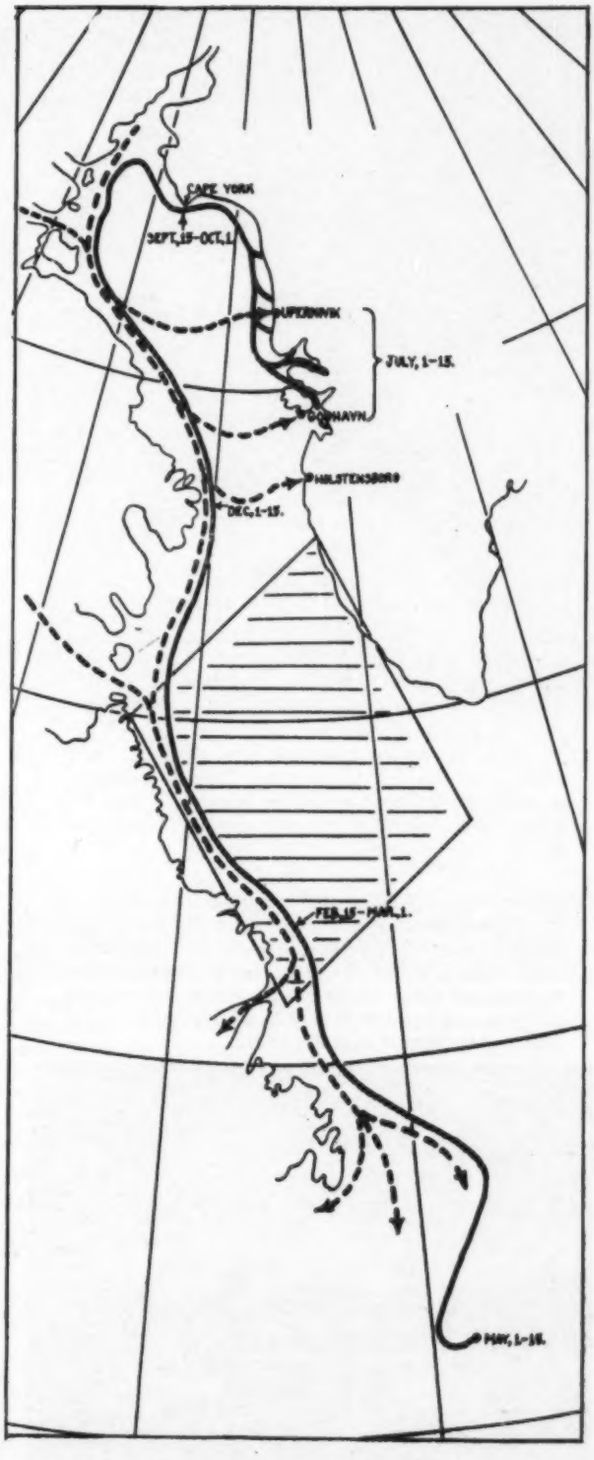
Grand Banks which carried them through the ice zone. Since the advent of larger and faster steamers, most shipping uses the routes southward of the normal ice zone during the dangerous period of the year.

The design of luxury liner *Titanic* represented a major advance in the division of a passenger liner into a series of water-tight compartments. She was generally considered to be unsinkable and was advertised as such. Consequently, her sinking as a result of collision with an iceberg off the coast of Newfoundland, with a loss of 1,513 lives out of the 2,224 passengers and crew aboard, focussed world attention on the dangers inherent in North Atlantic shipping and created a universal demand for patrolling of the ice zone during the dangerous periods of spring and summer.

Since the International Ice Patrol has been in operation, not a single vessel has been lost by collision with an iceberg during the patrol season and within the patrol area. The patrol was not in operation, however, during the hostilities of World Wars I and II and one merchant vessel was sunk in March 1943 after colliding with an iceberg, resulting in a number of lives being lost.

The only known casualty due to ice within the Ice Patrol area in 1959 occurred when the M/S *Lydia Marie*, a small coastal freighter of Canadian registry, disregarded ice warnings and struck the sloping face of a growler when five miles south of Cape Broyle, Newfoundland. The weather was clear and the sea calm and the *Lydia Marie* was able to proceed to St. John's, Newfoundland, under her own power. A few ships attempting to work through pack ice to enter Newfoundland ports, suffered minor damage to hull platings and propellers.

While not in the Ice Patrol area or during the period of ice patrolling, the tragic loss occurred on January 30, 1959, of the Danish motor vessel *Hans Hedhoft* with 95 passengers and crew. The 2,875-ton cargo-passenger, vessel, built for operations in ice, was on her maiden trip returning from Godthaab, Greenland, to Copenhagen when she struck an iceberg forty miles south-southeast of Cape Farewell, Greenland. The vessel was proceeding through regions known to be ice-infested the year round.



Schematic representation of drift of icebergs from West Greenland glaciers to North Atlantic steamship tracks. The 3,000-mile journey, which usually takes three years, may take as little as eleven months. The solid line shows the main track of icebergs; the broken line shows the path of pack ice; the shaded portion indicates the area of critical winter winds.

An ice chart giving an overall picture of the year's iceberg situation in the Grand Banks region is kept up-to-date by Lieutenant-Commander R. Dinsmore at the International Ice Patrol headquarters in Argentia, Newfoundland.

Radio station NIK, the communication centre of the International Ice Patrol at Argentia, receives ice and weather reports from commercial shipping as well as from vessels and aircraft on patrol duty. The station broadcasts bulletins of ice conditions to all shipping in the North Atlantic at regular times.

Ice Patrol Operations

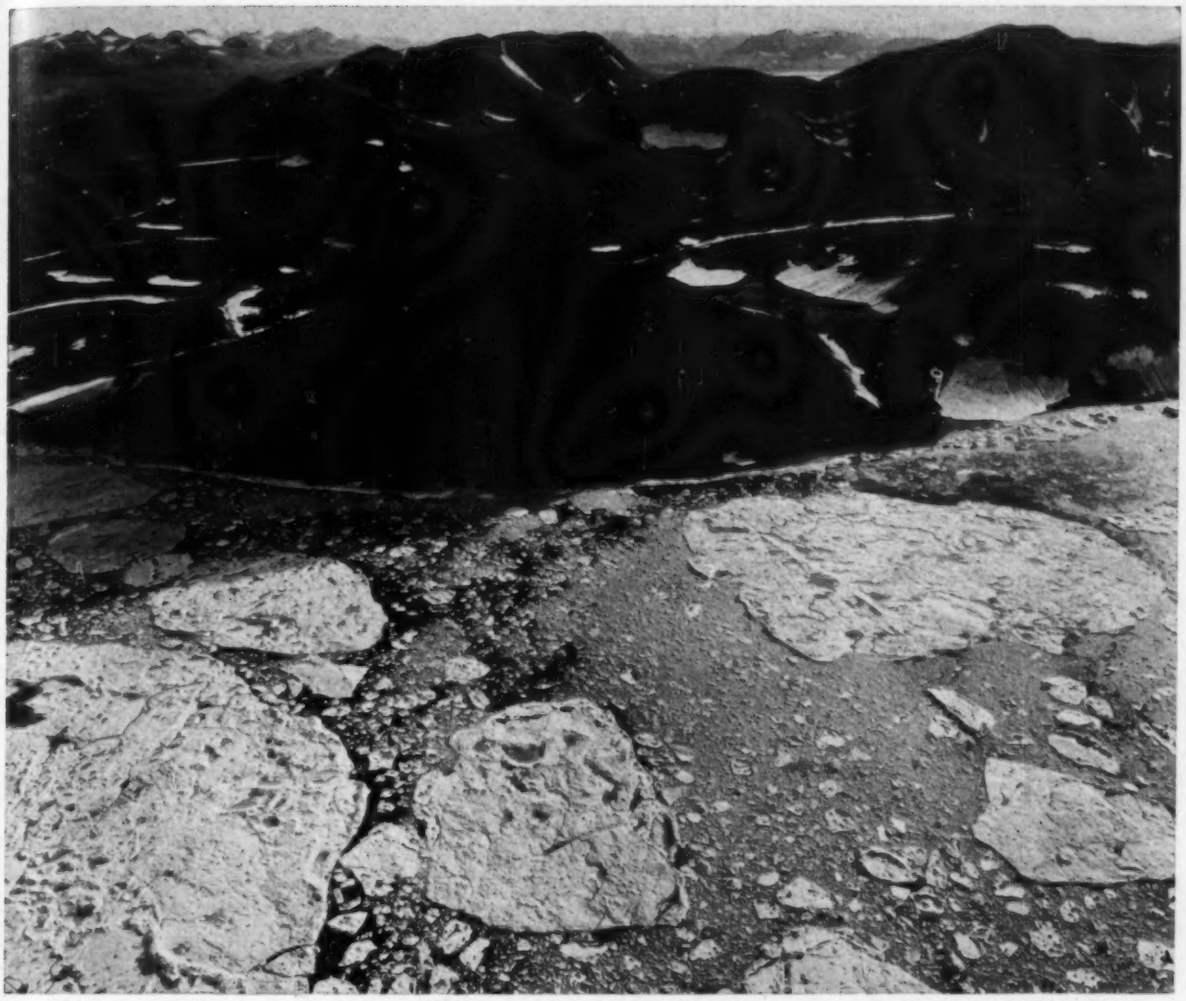
Every year, the International Ice Patrol commences the service of ice observation and ice patrol when the presence of ice begins to threaten steamship traffic in the North Atlantic. The patrol area covers, in general, the region of the Grand Banks. During a large part of the ice season, this area is blanketed in fog created by the confluence of the Gulf Stream and the Labrador Current, yet through this area passes the world's heaviest seaborne traffic.

The International Ice Patrol originally consisted of Coast Guard cutters which remained at sea during the danger season, screening the area and at times standing by particularly dangerous icebergs to warn passing ships. The advent of long-range aircraft has to a large extent changed the structure of the patrol. Except in fog or low visibility weather, aircraft have a great advantage over surface craft in sweeping the area and quickly determining from day to day the position of the many icebergs. Ice observation flights range between 1,000 and 1,300 miles in total distance, with flight altitude of 1,000 feet. It is often necessary to descend to near wave-top level in order to retain surface visibility or identify radar targets.

The use of surface craft is often required at short notice, as fog may descend with little warning and may obscure the surface for weeks at a time. During the 1959 patrol season, aerial observations were hampered by persistent fog conditions off the Grand Banks, which made it necessary to use surface patrols. This was only the second time surface patrols were required since 1950. The other occasion was in 1957 when more than 900 icebergs were sighted south of the 48th parallel.

Headquarters of the International Ice Patrol during the patrol season is located at Argentia, Newfoundland. Headquarters maintains constant touch by radio with both aircraft and surface patrol units as well as merchant vessels and commercial aircraft traversing the Ice Patrol area. Reports of ice sightings are received from many sources all over the northwestern Atlantic.

Reports of ice sightings are carefully analyzed and evaluated in the light of



Cape Joseph Henry, northern tip of Ellesmere Island and but 750 miles from the North Pole. There the main Canadian Current funnels through between Ellesmere and Greenland to Baffin Bay where it forms part of the Labrador Current which carries icebergs to the shipping lanes of the North Atlantic.
R.C.A.F.

meteorological and oceanographic conditions to determine their actual and potential danger. Routine broadcasts of all ice conditions hazardous to shipping are made several times daily. The position and course of ships travelling through the danger zones are charted, together with the position of all dangerous icebergs. Headquarters of the Ice Patrol thus has a complete picture of the situation at all times and is able to issue warnings to individual ships where necessary.

Canadian agencies reporting to the International Ice Patrol headquarters are the Ice Forecasting Central of the Canadian Meteorological Services at Halifax, Nova Scotia; the aerial ice observers at Moncton, New Brunswick, and Gander, Newfoundland; and shore stations reporting ice conditions along the Newfoundland coast during the field ice season.

Ocean Currents

Ocean currents are the main factors which affect the movements of icebergs and growlers. In most cases the influence of the wind is small compared with the effects of the ocean currents. The region around the tail of the Grand Banks, where the tropical waters of the Gulf Stream and the icy Labrador Current meet, exhibits the greatest hydrographical contrast to be found anywhere in the world.

The Gulf Stream, which crosses the deep oceanic triangle between Nova Scotia and

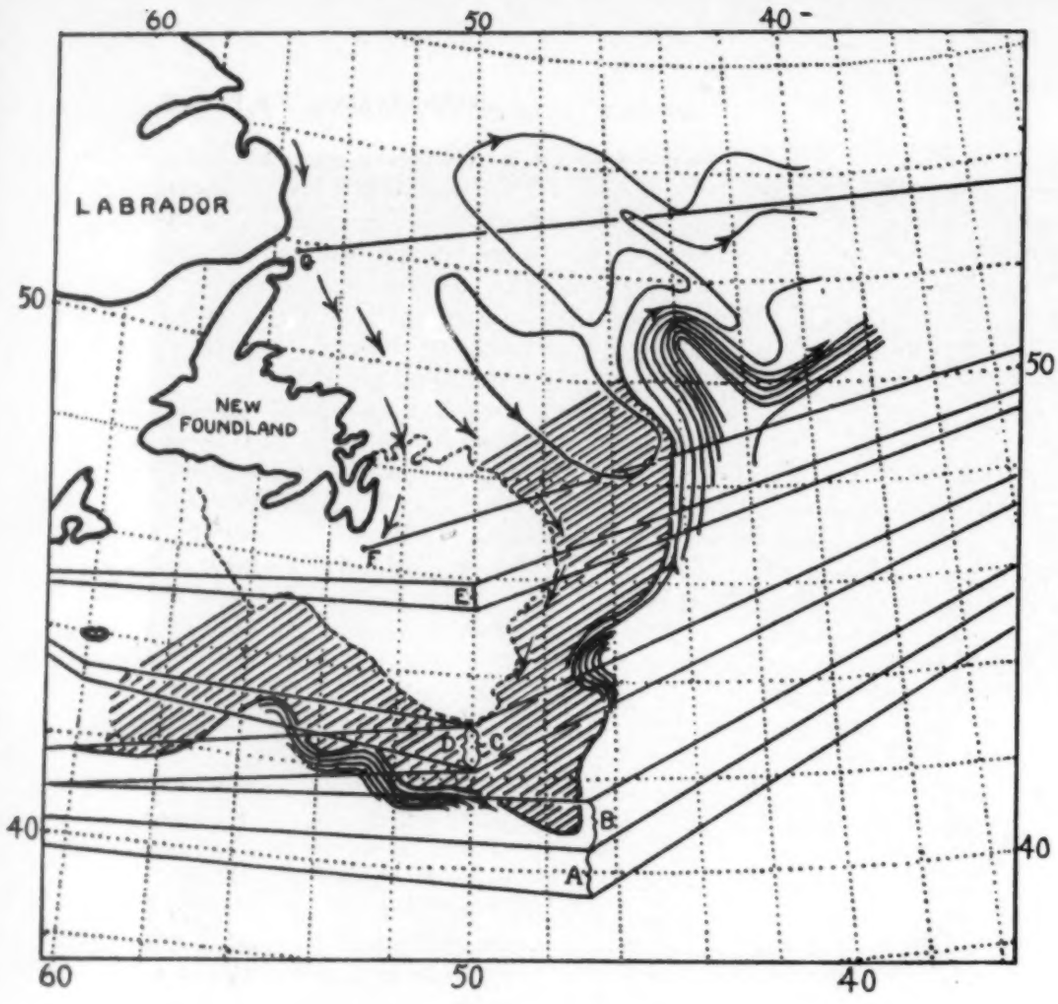


Diagram showing steamship tracks A, B, C, D, E, F, G, and the area of fog southeast of Newfoundland. The offshore boundary of the shaded area is known as the Cold Wall. Inshore over the shaded area and the Grand Banks is the persistent fog area created by the meeting of warm and cold ocean currents. Note the salient of the warm Atlantic Current extending northeast to latitude 51° N. in longitude 44° W.

the Grand Banks, is known as the Atlantic Current on passing the tail of the latter. It spreads fanlike to form many complex tongues and eddies as it continues to the northeast and east. The surface temperature of the northern edge of the Gulf Stream near the Grand Banks is around 54° F. in winter and 62° F. in summer.

The Irminger Current is a recurving branch of the Atlantic Current of the Gulf Stream System and combines with the East Greenland Current near Cape Farewell, Greenland, to create the West Greenland Current. This flows northward along the west coast of Greenland and is relatively warm and salty. After losing volume it branches westward to Davis Strait and Baffin Bay.

The Labrador Current is formed by the junction of that portion of the Canadian Current which flows southward across the Davis Strait Ridge and the branch of the West Greenland Current which has curved westward. The resulting Labrador Current flows southward along the Labrador Coast and the East Coast of Newfoundland and completely floods the northeastern part of the Grand Banks. The main branch of the Labrador Current continues southward down the east side of the Grand Banks and bears ice farthest south, menacing the main steamship tracks.

In its flow down the coast of Labrador all the way to the Grand Banks, the Labrador Current retains the characteristics of the two currents which have created it. The frigid Canadian current remains on the coastal side of the Labrador Current while the warmer West Greenland component remains on the offshore side of this flow of water.

A branch of the Labrador Current enters the Hudson Strait along its northern side for as much as 250 miles and leaves by the southern side. Another branch of this Current enters the trough-like Strait of Belle Isle on the Labrador side and out on the Newfoundland side. A third branch of the Labrador Current proceeds along the Avalon Peninsula of Newfoundland. The extent of

Arctic intrusion into the Gulf of St. Lawrence is largely controlled by tides, winds and barometric pressure.

When the Labrador Current reaches the Gulf Stream System it curves to the east, paralleling the Atlantic Current on the northern border of the latter, and gradually loses its identity through mixing.

Oceanographic Studies

The oceanographic programme of the International Ice Patrol in 1959 was carried out in four separate surveys by the United States Coast Guard cutter *Evergreen*. mapping the ocean currents affecting iceberg drift into the North Atlantic. Charts of currents produced as a result of such surveys prove invaluable in the evaluation of iceberg reports and the prediction of iceberg drifts. The International Ice Patrol employs the latest oceanographic techniques for the prediction of iceberg drift and deterioration. Oceanography has long been an important activity of the Ice Patrol.

Besides the regular work of locating icebergs and warning passing vessels of the danger limits, officials aboard the Ice Patrol cutters also make a study of the physical properties of the icebergs; their drift, erosion and melting, temperature of adjacent sea water and atmosphere; and also the habits of birds and seals with regard to ice.

Demolition Experiments

Demolition tests are the dramatic event of any year's patrol. Icebergs have so far resisted destruction by gunfire or high explosives. They likewise cannot be towed or pushed and they cannot be rammed except in their last stages when rotten with slush. They disintegrate when they meet the warmer waters of the Gulf Stream.

Demolition experiments were carried out in 1959 by means of bombs dropped on icebergs by International Ice Patrol aircraft, using among others, thermite explosive charges similar to those first developed by the late Professor H. T. Barnes, of McGill University, in 1926.[2] Ice Patrol officers have long been aware of the experiments by Professor Barnes on grounded icebergs off Newfoundland, using thermite charges. The reports of Professor Barnes' work indicated profound results.[3]

Bombing by incendiary bomb clusters having high temperature characteristics featured the 1959 demolition experiments. Ten of the bombs used contained a thermite mixture. Each of the thermite bombs used had a cluster of 182 incendiary bomblets, each of 4-lb. weight. Each bomblet contained 10 ozs. of thermate (thermite with a binder material) and there was a total of 114 lbs. in each bomb cluster. While the tests were successful, the bomb clusters were not able to deliver the required concentrated high temperature source necessary to the thermale stress theory of ice demolition.

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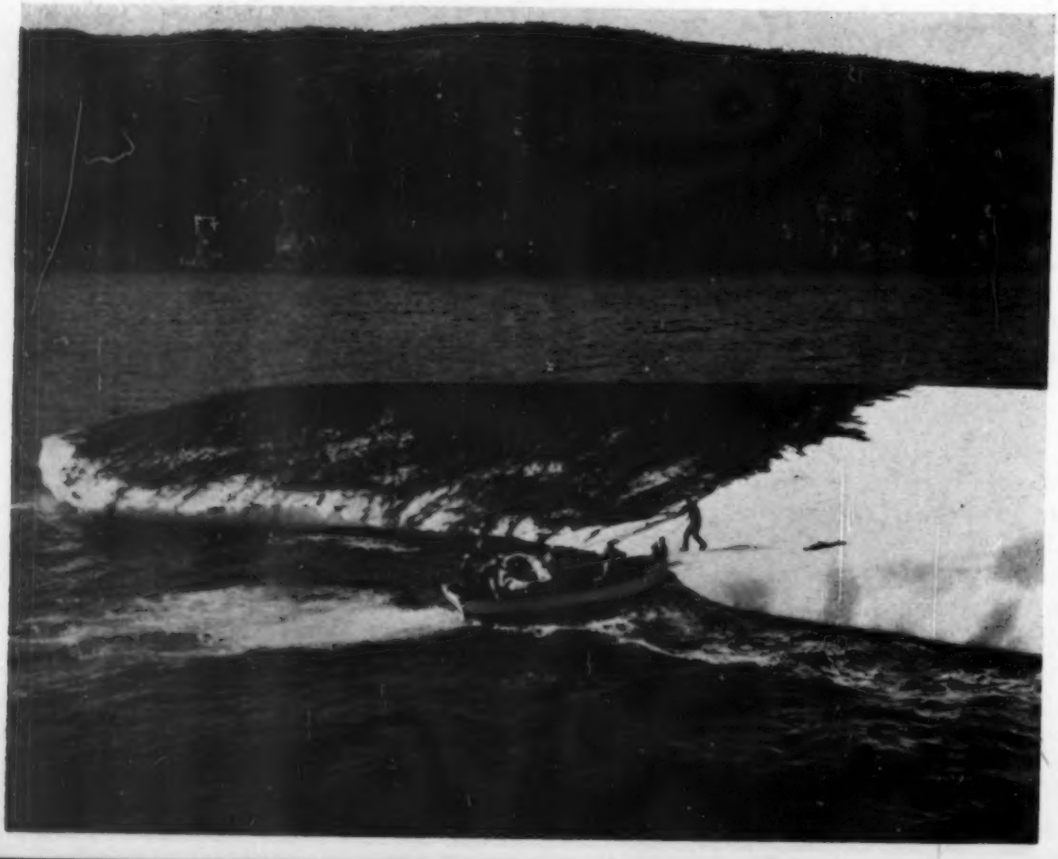
[2]Thermite, a mixture of powdered aluminum and iron oxide, is an incendiary charge. When it burns it can produce a temperature of 4,000 F. degrees (half of the sun's surface temperature) and molten iron is released which acts as a heat reservoir for the combustion of related materials. Actually it is not an explosive. Ignited on ice, however, thermite is extremely dangerous as it reacts in a unique way resulting in a great explosion of steam and hot molten iron.

[3]Proceedings of the Royal Society, London, Vol. 114A.

An International Ice Patrol vessel and ice reconnaissance aircraft join in keeping watch on an iceberg off the Grand Banks of Newfoundland.



An iceberg, 180 feet high and 325 feet long, is boarded by an International Ice Patrol demolition team carrying 364 pounds of thermite. Iceberg boarding and demolition are always dangerous tasks.

Left: — In Bonavista Bay, Newfoundland, half of a 150 feet by 75 feet tabular iceberg has been painted over with lampblack carbon. In twelve hours the iceberg disintegrated to a third of its original size.

Right:—A thermite explosion sends a geyser of ice, steam, and smoke skyward from the iceberg as hot molten iron contacts the ice. Two such tests with thermite failed to have a marked effect on this iceberg.

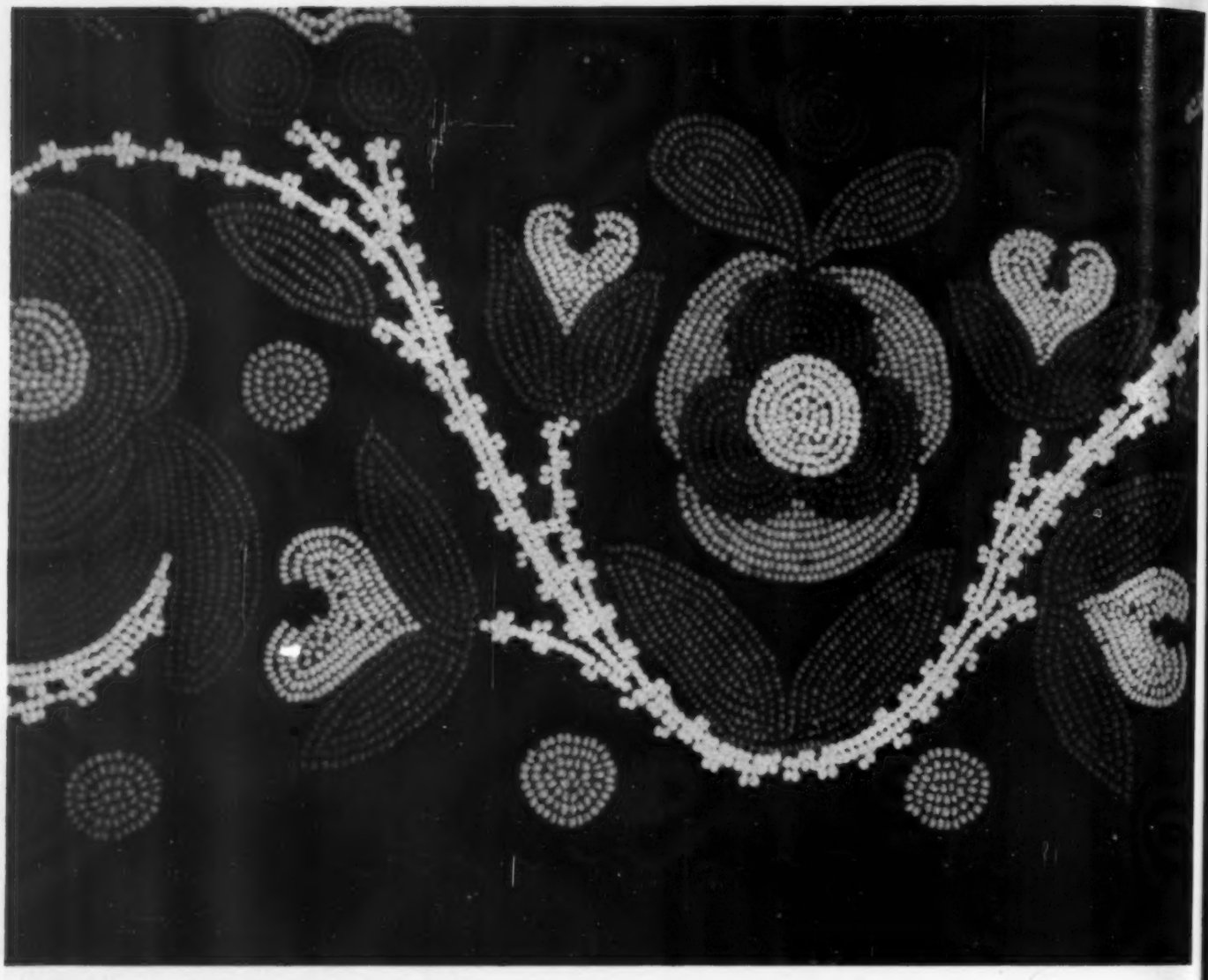
In view of the light ice condition in 1960, the International Ice Patrol carried out more extensive demolition tests on icebergs than had been possible in former years. For the tests with thermite, an iceberg grounded in Bonavista Bay, Newfoundland, was selected as a target. It was 325 feet long with a pinnacle 180 feet high. The iceberg boarding party drilled holes in the ice and embedded 13 charges of thermite, each of 28-lbs., making a total of 364 lbs. A second blast of twenty charges of thermite, totalling 560 lbs., was detonated the following day. Neither blast had any marked effect on the iceberg. Another thermite demolition test was carried out on a smaller iceberg in which six charges of 28 lbs. each was used. The only result shown was a small crater, only a few inches deep, which was filled with melting ice cubes.

Direct hits were made on iceberg targets with 1,000-lb. bombs of the general purpose conventional type during the 1960 demolition tests. Damage to the icebergs was insignificant.

The most successful demolition tests undertaken during the 1960 operations by the International Ice Patrol made use of lamp black or carbon. Results of considerable promise were reported. A tabular iceberg 75 feet wide and 150 feet long was used. One hundred pounds of lamp black were spread over half of the area of the iceberg on the basic theory that the carbon with its potential powers of holding the heat from the sun's rays could hasten the natural deterioration of the iceberg. Within twelve hours after application, the iceberg had disintegrated to a third of its original size. Coast Guard officials say that it was impossible to determine whether this disintegration was due to the effects of the carbon black or was coincident with the inevitable natural breakup of the iceberg. They took the view, however, that the results warranted further tests being carried out with carbon black in 1961.

* * *

The work of the International Ice Patrol has done much to protect world shipping in the North Atlantic from the danger of collisions with icebergs and has greatly increased scientific knowledge with respect to ocean currents in these waters. Its operations are an outstanding example of the value of international co-operation.



Floral designs are often used in Cree bead-work, and are frequently created by the women themselves. Shown here is a piece of beading for the back of a jacket.

Mrs. Cora Sanderson, one of the expert bead-workers, begins work on a small flower detail. Beside her is the completed beading for a medicine bag.

Mrs. Harriet Halkett, an expert bead-worker, helps to judge the bead-work of the Cree women.

Pattern of Progress at Lac La Ronge

by ADELAIDE LEITCH

Photographs by the author

IN THE lake-streaked country north of 55° in Saskatchewan, an ancient craft is adapting to today. On the shores of a Precambrian lake, until recently inaccessible save by aircraft, over a hundred Woodland Crees are making a niche for their work in the competitive, artistic world of today — and using today's methods to do it.

When they walk down the windy street and up the steps of a little building with a boomtown front, they walk firmly, proudly. They come to a building that is theirs. They bring the stock for a business which belongs to them, and which provides a showcase for their own, tribal work.

June, 1960, saw the opening of the Northern Handicrafts Co-operative Association Limited, with a charter granted in May, and with 119 Cree worker-owners. What they offer there are the old Cree designs, the lovely, geometric patterns that each woman creates for herself, or which she inherits from her mother and her mother's mother. They also use the old flower patterns that came originally from Hudson's Bay Company designs or from their own observations in the woodlands around them.

Ask Mrs. Cora Sanderson where she learned to do her lovely, careful work, and she smiles softly — "My mother taught me." Or watch Mrs. Joe Bell working the beads onto the pliable skin with a craftsman's touch — at the age of 83. Mrs. Harriet Halkett is a gentle little lady — except when she helps judge the quality of work that comes to the Handicrafts Association, and then she is one of the sternest judges in the village.

This started as an all-woman organization — workers, board and manager. The Cree women set the prices, watchdog the quality, pay a manager's salary. They have an annual statement, and either turn the profits back into more stock, or convert them into cash, as they so decide.

As it does with new co-operative businesses in the province, Saskatchewan's government gave them a helping hand at the start, with a modest grant and trained advisers. Advice came also from the Saskatchewan Arts Board, and from Mabel and Berry Richards who began an original crafts shop for the Crees some years back. But, once in operation, the handicraft centre was on its own.

The workers hoot to derision any woman

The traditional, geometric designs of the Crees are being used extensively again, as an old craft revives.

Some of the children of the village are also learning the skills of beading.

among them with the temerity to bring to *their* shop a piece of inferior work — and are adamant in refusing to let their manager put it out for sale. When the co-operative shop's first manager, Beth Maxwell — the only non-Indian in the organization — suggested prices were not set high enough, considering the time and materials that went into the work, the Cree women on the board shook their heads. No, they said. The price was fair. They were satisfied with it.

When one skilled lady wanted to bring in some silk embroidery which is really a Chipewyan skill, she did so only with the permission of the other Crees, who were experiencing a growing pride in their own bead-work.

The beading, properly done, is not simple.

Shop manager Beth Maxwell receives a pair of completed moccasins from a young visitor delivering them for her aunt. The board of the co-operative decided that work would be brought in Tuesdays and Fridays before 11.00 a.m.

Mrs. Joe Bell, aged eighty-three, works away a long afternoon on her beading. The women often visit as they work, discuss changes or improvements they would like to have in their new co-operative.

Colours must be chosen with the skill of an artist. Individual beads must be threaded in groups on the needle. Then, working with two threads, the woman fastens them to the deerskin or moosehide; one thread holds the beads, while the other anchors every second bead in place.

The headquarters for the Handicraft Association at Lac La Ronge is this new building with a "boomtown" front.

Before the white man came, the Indians decorated their costumes with beads made of pierced stone and shell. Later, traders brought them coloured glass beads which the colour-loving Indians eagerly used. Today, you can buy packages of coloured beads in Lac La Ronge as you can in Toronto or Vancouver.

In addition to the familiar beaded moccasins — pointed toes in the Chipewyan style, rounded toes in the Cree style — they began to make jackets, firebags and medicine bags. The old articles that were used in Indian life suddenly became popular with the people of Lac La Ronge and their visitors. The ancient beaded collar, the *Megis Tapiskagen*, which can be bought in their shop today, was not developed for the tourists, but was actually worn as part of the woman's costume in the old days.

In the past, the woman walked behind the man on the trail, but she was an equal partner with him in the home and family. No one in the 800-person village at Lac La Ronge today considers it odd that the women of the tribe are now in business for themselves. Nor is the co-operative arrangement unfamiliar to them. A Cree, first of all, is responsible for himself. But after that, he lives, traditionally, in a co-operative, non-acquisitive, non-materialistic society. No man goes hungry in an Indian village unless the whole tribe is going hungry.

In the first three months of its existence, the business in Lac La Ronge turned back $4,000 to the women. One woman made $120 in one month — not an "assist" to the family budget but, for that month, the *entire* family budget.

And so the nimble fingers flew faster and faster in the small homes near big Lac La Ronge. The local stores agreed not to compete in the sale of Indian work, but the women still fought a fierce battle with the cheaper, Japanese imitations of their bead-work.

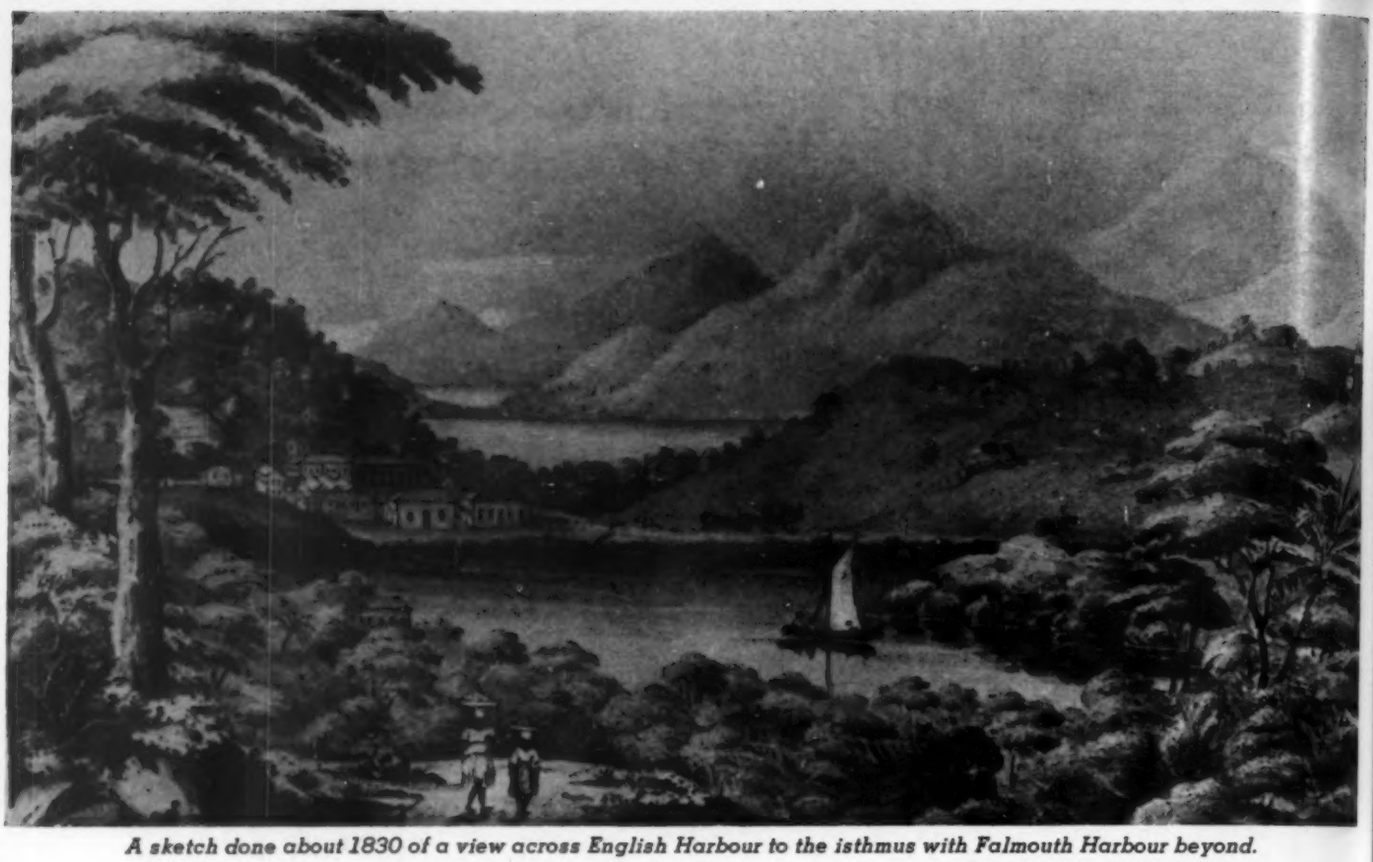
Meanwhile, into Lac La Ronge came the wealthy sportsmen and their families, bound for the sport fishing of the lake country and, in the first months, the workers could not keep up with the demand for their bead-work. Now, they want to expand. Far to the south, craft shops claim they cannot get good Indian work, and American visitors especially keep asking for it.

As progress marches inexorably north, the Indians look for a new role in the country's economy. In this mineral-rich northland above the prairies, prospectors and development companies are hard at work changing history. East from Lac La Ronge, the change is coming with even more of a vengeance, as a gigantic new power development at Grand Rapids floods two entire lakes in the Indians' old trapping lands. At Lac La Ronge itself, life is changing, and a new road is crawling north over the Precambrian Shield toward Uranium City and the resources locked in northern Saskatchewan.

But one of the loveliest of the resources of the new order in the north could well be the bead-work of a hundred business-minded women who are bringing a traditional craft to the attention of many other Canadians.

The main street of Lac La Ronge, Saskatchewan. This area was frequented by fur-traders from the late 18th century.

A storm brews over Lac La Ronge. The lake has an area of 450 square miles and contains more than a thousand islands.



A sketch done about 1830 of a view across English Harbour to the isthmus with Falmouth Harbour beyond.
Redpath Library, McGill University

A map of the island, first published in 1794. English Harbour is immediately to the right of Falmouth Harbour, lower right.
Public Archives of Canada

A sketch by J. Johnson, drawn before 1830, shows a view of English Harbour from the lofty fort on Monk's Hill. Redpath Library, McGill University

English Harbour, Antigua

by W. GILLIES ROSS

Photographs by the author except where credited

ENGLISH Harbour has long been associated with the name of Horatio Nelson who, as a young naval officer, was based at this remote West Indian station from 1784 to 1787. In fact, the old facilities for the docking and repair of ships and the accommodation of personnel, which today constitute such a unique monument to the days of British naval supremacy, are collectively known as "Nelson's Dockyard" simply because of the proud association with this famous man. Although the dockyard ceased to function as a naval base more than a half-century ago it serves today as an active yacht center; there is life and movement amid the restored buildings, wharves and capstans of the Nelson era, and one is reminded constantly of the past.

The harbour itself is small and narrow, a winding valley drowned by the sea several thousand years ago after the great continental ice sheets of our latitudes melted away. Cut neatly into the mountainous south coast of Antigua, it is almost invisible from seaward, and a stranger could sail within a quarter mile of the entrance without suspecting its presence. From the dockyard within one cannot see the ocean, for a right angle bend interrupts the view. Because of the enclosure by headlands and the surrounding hills the harbour is sheltered from strong winds and the swell of the open sea. Some claim it to be one of the most hurricane-proof ports in the West Indies and only rarely have ships been torn from their moorings during such storms.

Antigua was captured by the French in 1666. After this episode, during which the planters lost houses, sugar-making equipment and slaves, there was a strong local feeling that the defence of the island should be more secure. Defence had to be provided against the French forces on Guadeloupe, about fifty miles to the south, and on Martinique, not far beyond. Defence was required also against the

Carib Indians, the fierce aborigines of the Lesser Antilles who hindered the settlement and growth of colonies for three centuries. As late as 1786 Lufmann reported that a night guard of fifty men was still being mounted on Antigua in case of Indian attack. Because the principal Carib settlements as well as the centers of French strength were south of the island, the fortifications from Carlisle Bay to English Harbour made up the front rank of defensive positions.

By 1700 the popular anchorage of English Harbour was protected by a battery of guns at the mouth and within a few years naval ships were using the small port frequently. As a naval base it proved very useful during the warfare of the eighteenth century, and indeed during times of peace as well, when the chief task of the Royal Navy was to curb the smuggling activities carried on with such determination by the Antigua planters and merchants, who constantly defied the Navigation Laws to trade with foreign ships.

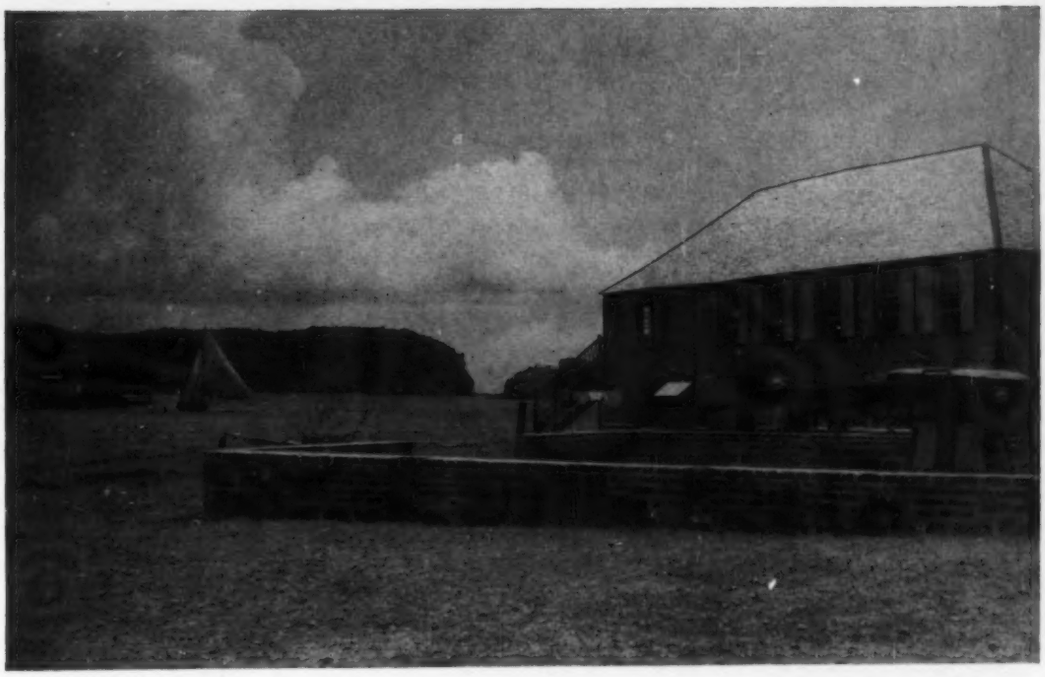
Improvements were made in the dockyard during the 1700's. The site of the first small wharves was moved across to the west side of the harbour where earth and rock fill was extended out from the land to provide more space. Suitable wharves, warehouses and magazines were erected. Capstans were built in order that ships might be pulled over onto the sides of their hulls for bottom cleaning, painting and repairs, a process known as "careening". Water catchments were constructed to conduct rainwater into tanks. Docks were faced with copper and the harbour deepened.

Many early writers extolled the virtues of the narrow, well-protected harbour. It is no surprise that during each hurricane season a number of ships would converge on it to take shelter. At the first sign of an approaching storm, they would put out all available anchors, extend strong lines to various points on shore and then hope for the best. Hurricanes struck Antigua in 1681, 1722, 1740, 1754, 1766, 1772, 1780, 1811 and 1835, and only rarely did the buildings and ships within suffer much damage. The most notable occasion was in August, 1722, when the hospital was destroyed and some ships blown ashore.

The narrow confines of English Harbour, however advantageous for the safety of ships, were not calculated to improve sanitation, and disease spread easily among the ships' crews. Sir Kenneth Blackburne, former Governor of the Leeward Islands, writes,

> When one remembers that there were often between four and ten men-of-war lying in the harbour with a total comple-

A group of youthful Antiguans tries out the fishing.



A native sloop sails up into English Harbour after passing under the guns of Fort Berkeley on the point. In the foreground, an old capstan stands in front of the renovated Pay Office.

ment of between two or three thousand men, and that the harbour is almost tideless, it is easy to understand the stench, the flies and the disease which harassed this otherwise beautiful and healthy spot.

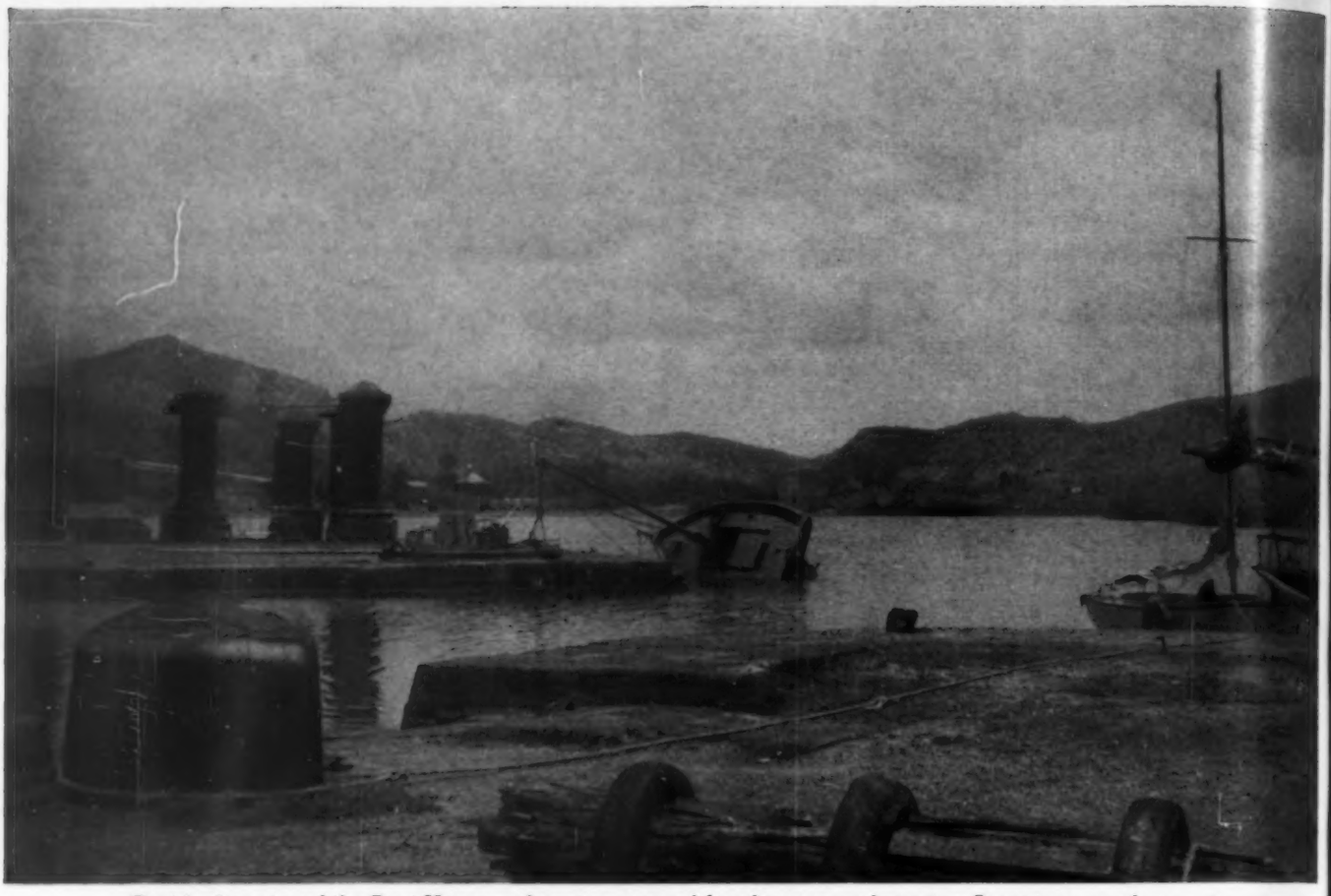
Besides the ships' crews at the dockyard there was a sizeable military force on nearby Shirley Heights. In 1803 these troops exceeded a thousand in number, and headstone inscriptions in the cemetery there testify that yellow fever was no stranger to them. Visitors to the neighbourhood did not hesitate to label it the most unhealthy place in the West Indies.

Horatio Nelson arrived at English Harbour in 1784, commander of the frigate *Boreas* and in charge of the Leeward Islands station. He lost no time in making his presence felt, had a brief clash with the Resident Commissioner and offended all the Antigua merchants — and the Governor himself — by enforcing the Navigation Laws to the letter. Before his arrival official eyes had turned away when American ships carried on trade, supplying the badly needed commodities of grain, timber and fish. But with Nelson there was to be no compromise; his sense of duty would not permit any "interpretation" of the laws in order to benefit the individual islands. A lawsuit for £40,000 was soon directed against him on behalf of four American ships that had been seized, but the British government supported him strongly.

Graft and corruption were widespread in Antigua at this time. The soldiers of the garrison frequently succeeded in putting their children on the payroll, and such acts in turn probably resulted from the failure of the officers to pay the soldiers for long periods. The merchants of the island were active in smuggling, and in their sales to government departments there was a certain latitude with prices, which cheated the Antigua government of £500,000, according to Nelson's biographer Robert Southey. These frauds were carefully investigated by the young captain and once again the displeasure of powerful merchants was incurred.

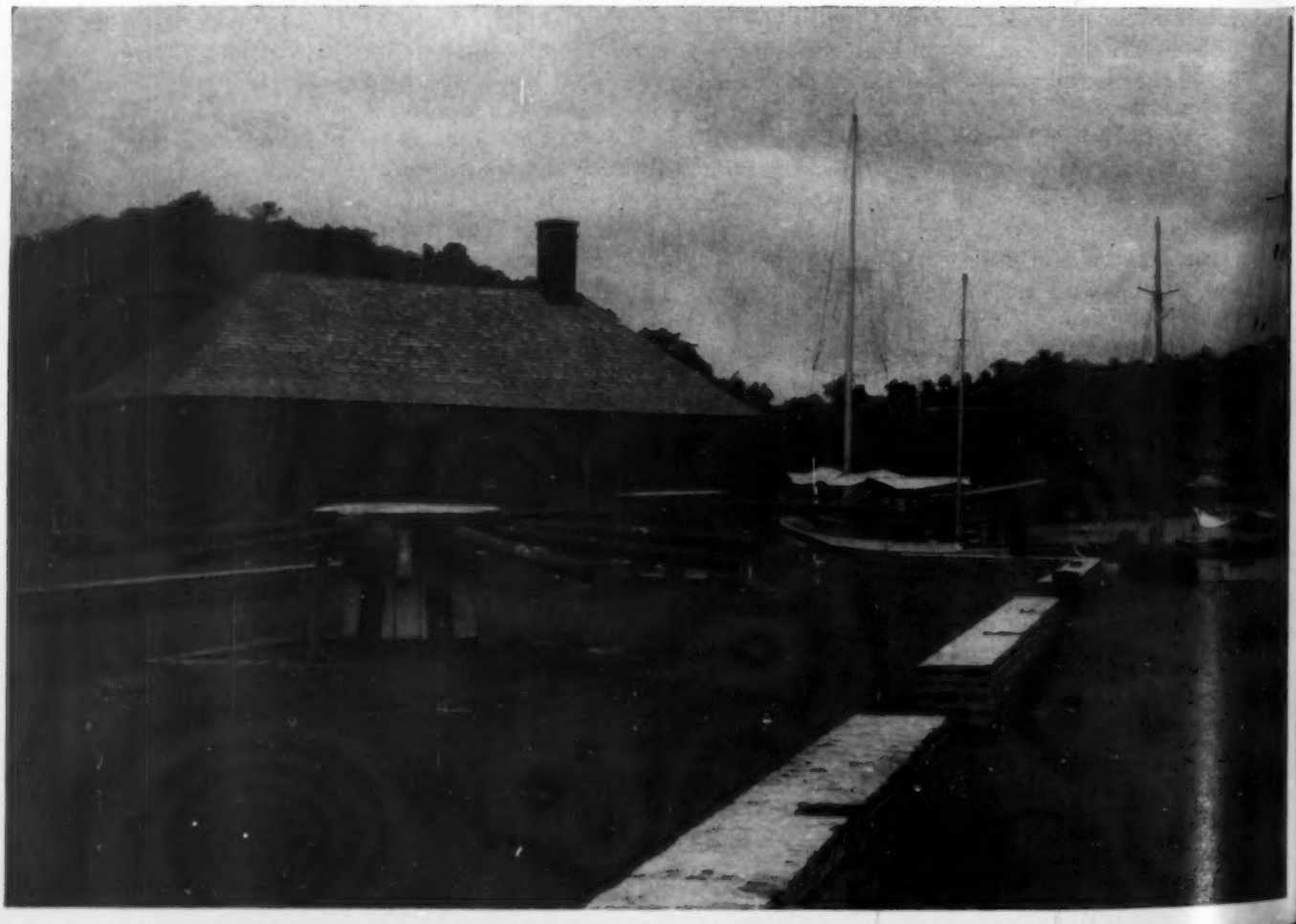
Despite the opposition of commercial interests, and an Admiralty reprimand for exceeding his powers in pardoning a condemned man, Nelson had some pleasant experiences in the Leeward Islands. He enjoyed a good friendship with Prince William Henry, Duke of Clarence, who commanded H.M.S. *Pegasus* and who later became King William IV. He met, on the island of Nevis, the attractive young widow Fanny Nisbet, who soon became his wife. And he exercised a firm but imaginative control over his own crew, paying careful attention to their morale and physical health. Nelson returned to England in 1787 without having lost a single man of his crew during his three year command.

Nelson's last visit to the West Indies was just prior to the Battle of Trafalgar in 1805. The combined French and Spanish fleet eluded him and he suspected strongly that its



Beside the ruins of the Boat House a sloop is careened for cleaning and repairs. A century ago large men-of-war were careened in similar fashion by the use of capstans.

The low walls mark the area of the capstan house, beyond which is the galley. The feeling of history makes English Harbour one of the most interesting yacht havens in the West Indies.



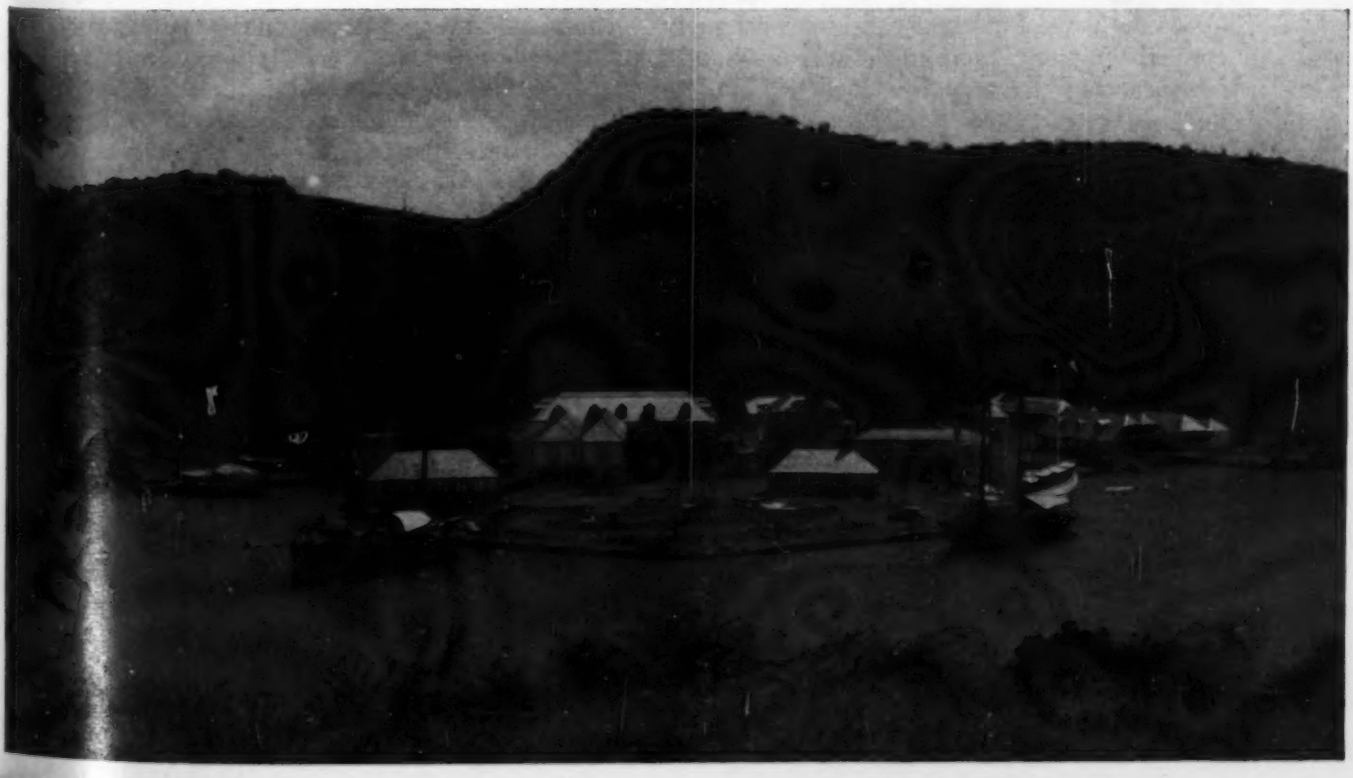
commander, Villeneuve, was sailing across to the West Indies. Despite the chance that he was making a mistake and risking ridicule he set sail for Barbados with his fleet. On arrival there he learned that Villeneuve was in fact among the islands. With Nelson in pursuit the French fleet left Martinique and started back to France, but the two fleets did not meet on the Atlantic. Nelson had chased the enemy well over 8000 miles without ever sighting him.

The dimension of English Harbour had always placed some restrictions upon the size of ships entering. In 1789 Maria Riddell wrote that ships of more than 54 guns had to lighten themselves at the mouth by removing guns. During the nineteenth century the size of ships increased and by 1900 most naval ships were too long and too deep to use the port. With the advent of iron-hulled, steam-driven ships the days of English Harbour were over. In no time at all the buildings were deserted, the docks crumbling, and the smooth waters unbroken by the prow of any ship.

Its days of glory forgotten, the small port lay dormant for many years, until in 1951 a concerted effort was made to revive it as a historic site. In that year the Society of Friends of English Harbour was formed to "preserve and restore Nelson's Dockyard . . . and to improve facilities for visiting yachts". The Society has carried on steadily the work of repair, depending largely on donations and subscriptions from supporters in many countries. More than $72,000 has been spent so far and much more is needed. Help has been supplied also by the crews of visiting naval ships (the ships anchor outside the harbour); in the Admiral's House there is a photograph of sailors from H.M.C.S. *Ontario* painting woodwork in April, 1956.

Today the dockyard is operated by Commander V. E. B. Nicholson, O.B.E., R.N. (Ret'd) who, with his family, has been dedicated to the task of restoring it both as a historic site and as a working yacht center. At any time there may be several yachts alongside. Some have just made Atlantic crossings; their crews are enjoying the strange sensation of a bit of land under their feet while they inspect the old buildings and the museum. They idly clean and repair their vessels and take time off to do some underwater sightseeing with face masks at the harbour mouth. Other yachts are resident ones that make charter trips up and down the Lesser Antilles with paying guests on board. For both the port is a pleasant spot for stocking up on fresh water and carrying out minor repairs. Once again English Harbour is a useful and active port for sailing ships.

The best view of the dockyard is obtained from Clarence House on the opposite side of the harbour. The buildings include the Pay Office, Officers' Quarters, Copper and Lumber Store, Admiral's House, Canvas and Clothing Store, Galley, Capstan House, Mast House, Boat House and Sail Loft, Engineer's Shop, and Shipwright's House.



A panoramic view of the Eardley escarpment, where the Precambrian rocks which form the Gatineau hills rise out of the flat sediments of the plains. View looking northwest.

Caves In The Gatineau District of Quebec

by J. L. KIRWAN

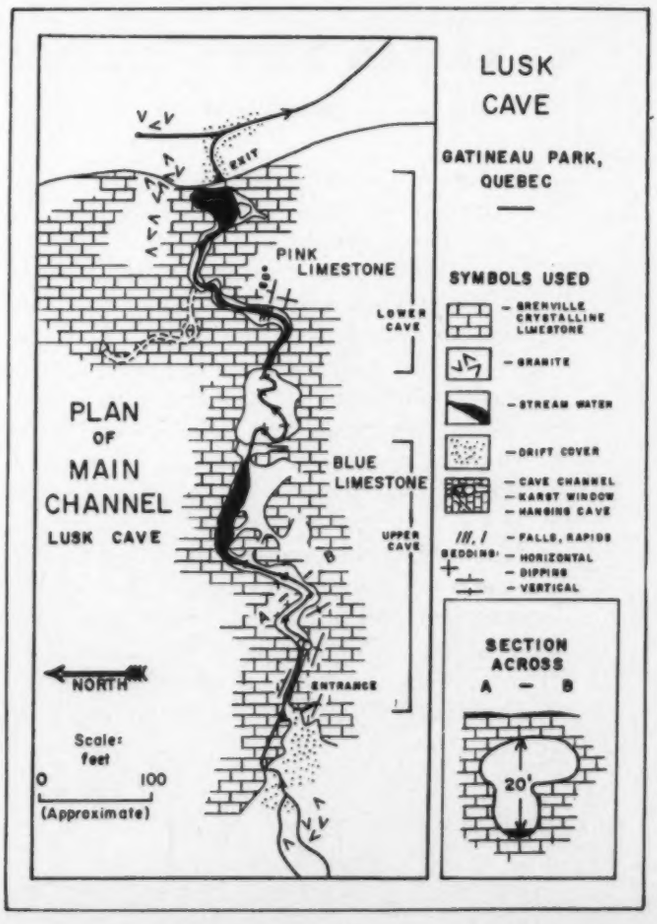
Photographs by the author.

CAVES of any great size are extremely rare throughout most of Canada, mainly because they have had very little time to develop since the last glaciation, and because the climate and relief features have been inadequate during this time. In addition, the huge areas of granites and metamorphic rocks present throughout the Canadian shield make this an extremely unlikely area for the formation of such erosional features. For these reasons, two small caves in the Gatineau hills of southern Quebec are of considerable interest to the geomorphologist—not so much because they occur in Canada, but rather because they both formed within the Canadian shield. They occur a few miles from Ottawa, near the edge of the shield where relief is fairly high, mountain streams are common and numerous small pockets of Grenville crystalline limestone outcrop.

Lusk Cave is within the federal parklands, about eighteen miles northwest of Ottawa. It is best reached by travelling through the village of Wakefield to the south end of Philip Lake, from where a footpath leads to the entrance a half mile away. Erosion of the cave was produced by a small stream which found its way through joint and bedding planes in the limestone, widening these through time. The stream enters through a narrow jointed passage which it follows for about fifty feet before entering the main cave channel. Here the walls are smoothly worn from ceiling to floor, indicating that the stream once flowed against the roof and reached its present level by downward

erosion through nearly twenty feet of limestone. Because lateral erosion of cave passages is greatly dependent upon the volume of the eroding stream, a cross section of the cave channel should give some indication of the changes in the rate of water flow with time. Here the cross section looks like a hollowed figure eight.

The channel of the cave is nearly seven hundred feet long. Throughout much of this length the bedding planes or other lineations visible within the crystalline limestone have controlled the direction of erosion of the stream so that the channel's sinuous path now reflects contortions visible in the host rock. The cave may be divided into two sections separated by an area where about fifty feet of the roof has fallen in. Low gradient, a thin roof with numerous small windows, considerable lateral extension of the channel and smooth walls of pale blue and greenish limestone characterize the upper section. The lower section shows irregular walls of pink or



Upper left:—The stream entrance to Lusk Cave, showing profiles of earlier and present water channels. The figure is standing on a slab of limestone from the collapsed roof.

Above:—A vein, which cuts across the stream channel of Lusk Cave, stands out in sharp relief against the cave walls.

white limestone containing many granitic inclusions and dykes. It also contains one waterfall, nearly ten feet high. Each of these sections ends in a trap where the stream has widened to form a small pond. Numerous small side passages and hanging channels indicate the devious routes the stream has followed in forming the cave. One side passage in the upper cave contains the only stalactites seen. These are about an inch long, their lack of development being explained by the thin roof of the cave (here about five feet) and the probable youth of the channel. Total drop in elevation throughout the length of the cave is about fifty feet, mostly in the lower section and the collapsed area.

A visit to Lusk Cave is fairly arduous

The beginning of the formation of wall encrustations from water seepage along cracks in the cave walls.

Lineations in the limestone of Lusk Cave parallel the water course throughout much of its length.

because of the irregularities and water flooding within the cave and the difficulty of entering side passages. An exhaustive tour would take most of a day.

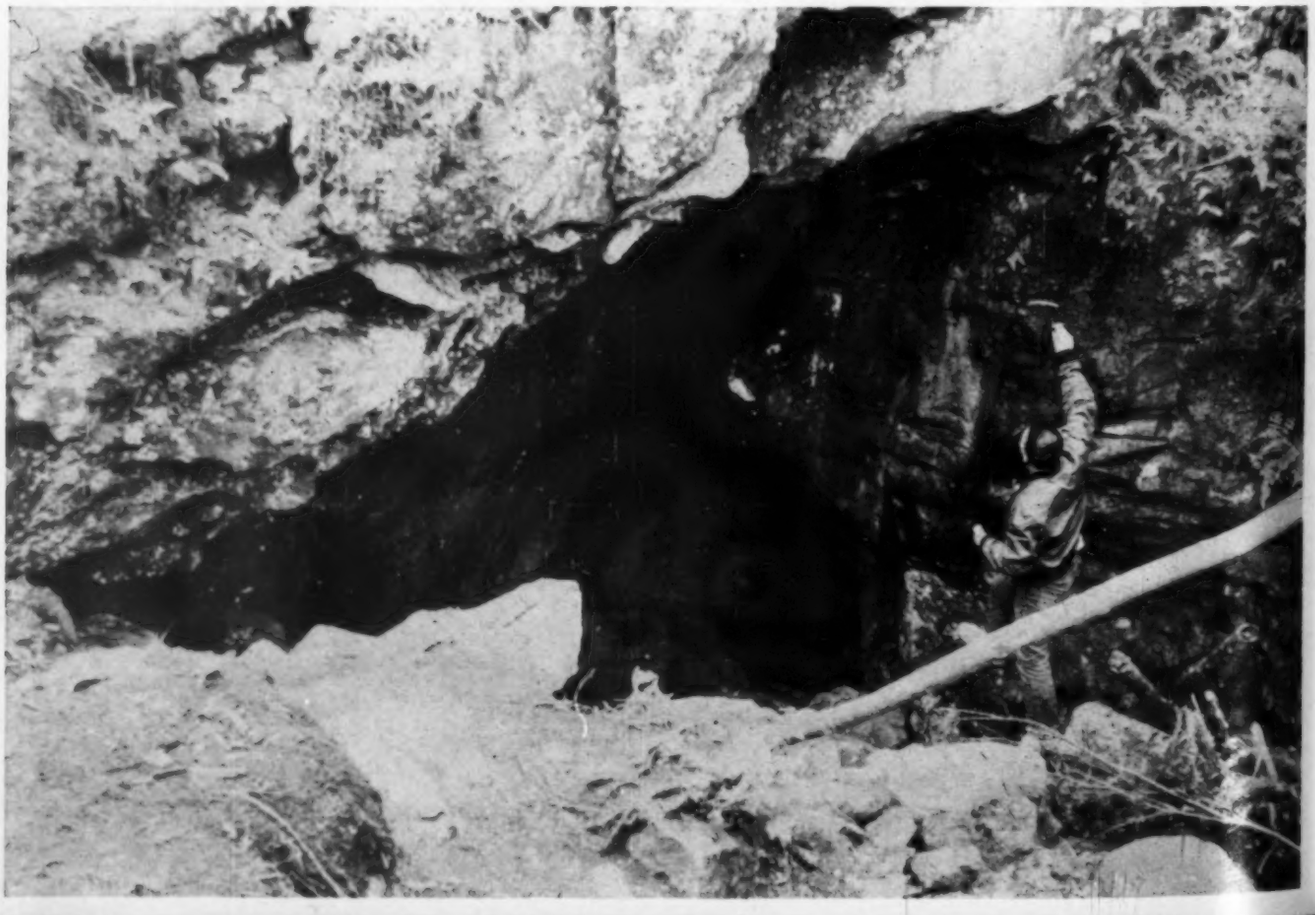
Lafleche Cave, Wakefield Cave or "La Caverne" as it is variously known, is a commercial enterprise about twenty miles north of Ottawa, from where it is easily reached by car. The cave is much larger than Lusk Cave and has been described as the largest known in the province of Quebec—although it is insignificant when compared with such caverns as those in the Mississippi region. It is roomy, artificially lighted and dry with well developed stalactites, stalagmites, wall encrustations and other speleothems. The cave is quite famous and, as a number of articles have been published concerning it, these descriptions need not be repeated here.

Elsewhere in the Gatineau region, such as at McGregor Lake and near Wakefield, a few small caves are known. Many of these, however, are but widened joint passages, roofless and of no great size.

A typical roof window at Lusk Cave seen from the outside.

The small pond which marks the end of the upper cave forms a partial impasse, the only dry routes around it being very constricted. Sandstone and granite inclusions, which stand out from the marble because of differential erosion, are visible in the picture.

The stream, after leaving the upper cave, cascades downward through the rubble from the collapsed roof and enters the lower cave, the beginning of which is shown in the picture. Just beyond view the stream turns left to plunge over the cave's waterfall which, although fairly small, seems like a torrent inside.



These little stalactites (the size of which is indicated by the finger tip) occur in a small side passage at the end of the upper cave. They show an irregularly tubular cross section which aids the passage of dripping water. Other stalactites, formerly in this area and slightly longer than those shown, have been removed by visitors.

The stream exit of Lusk Cave. Within the cave, the stream enters a sandy trap to form a small pond, part of which protrudes beyond the cave exit shown in the picture. Part of the limestone hillside, in which the lower cave is cut, is visible.

Concrete foundation supports for heavy processing machinery stand alone in a field, the "Stonehenge" of Haliburton.

The Haliburton Country—Land of Promise

by J. H. G. BURKE

Photographs by the author.

DIRECTLY north of the chain of Kawartha Lakes which spread-eagles across central Ontario is a beautifully rugged, yet easily accessible, rough-and-tumble country called the Haliburton Highlands. Highways cut through granite hills, past myriad lakes and streams, spruce swamps and hardwood uplands, providing a choice vacationland for industrial southern Ontario. Each summer this 3000-square-mile area is a beehive of tourist traffic, and in the autumn, the deer camps are always filled to capacity.

But few people are aware that this is a country which has lived and died, and come to life again. For this region was feverishly invaded by prospectors, lumbermen, railwaymen, and land promoters just before the start of this century because of reports that the country was rich in large stands of pine and hardwood. There were exciting reports of mineral wealth also. The Dominion government sent geologists to study the rocks, and the report of Adams and Barlow in 1910 revealed that deposits of iron, corundum, mica, marble, molybdenum, talc, uraninite, fluorspar, garnet, and graphite were all easily available.

The Haliburton-Bancroft region proved to be the site of extremely varied geological occurrences on the south-eastern fringe of the Canadian Shield. Large bodies of sedimentary and volcanic rocks had been subjected to mountain-building processes, and large masses of granite and other igneous rocks had formed in the roots of the mountains. These ancient ranges were worn down through erosion, seas encroached again over the resulting lowland, and the cycle of deposition, mountain-building, intrusion, and erosion began anew. It is not definitely known how many times this

Large mounds of crushed rock surround this pithead where, at the turn of the century, miners sought wealth in iron and arsenic.

cycle was repeated. As a result of this complex history, the area now consists mainly of granite and granitoid gneiss with remnants of volcanic and sedimentary rocks. It has apparently been a stable mass for over a billion years.

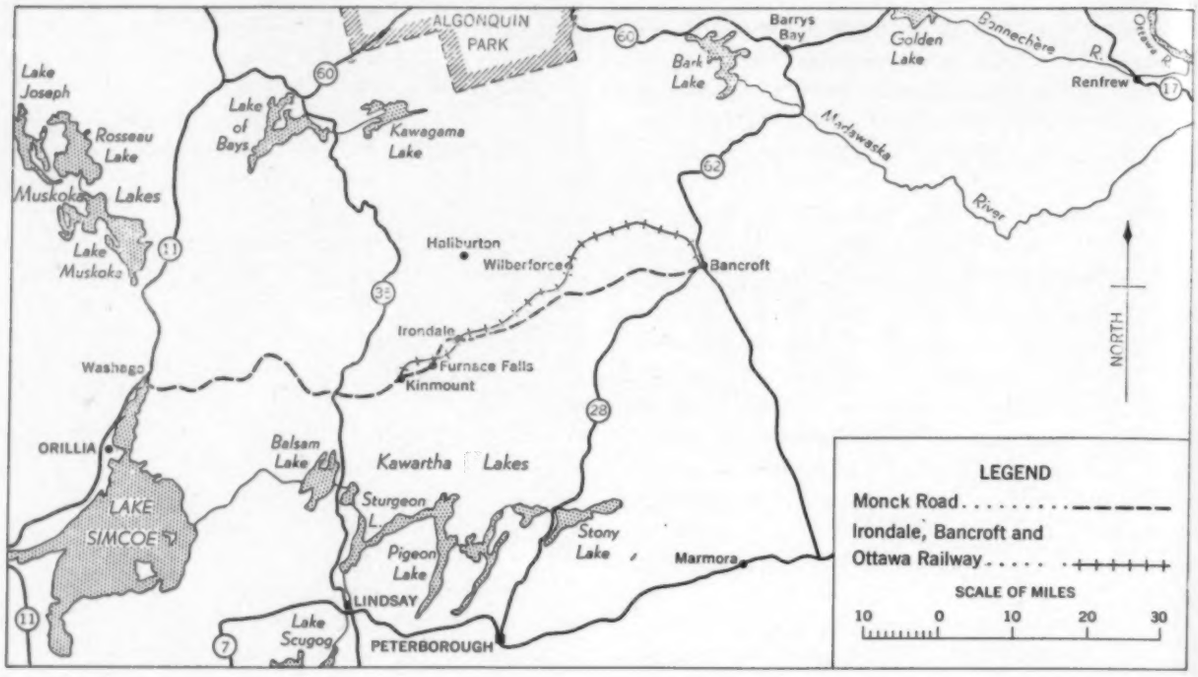
When news of the mineral occurrences spread, the area became pocked with prospects, mostly of the open cut type, as Canadians, British, and Americans flocked to the scene. Enterprises opened with great flourish but one by one they foundered and closed. Typical of this pattern was the Virginia Graphite Company which opened a property near Wilberforce in 1910 and operated a mill with indifferent success until 1913; the holding was sold to the New York Graphite Company but closed down in 1919, and has not operated since.

A number of molybdenum deposits were opened during World War I and gave a small production, but have been largely inactive since. The mines were re-examined during World War II but none re-opened. One after another, mining operations on other minerals proved to be unprofitable, either because the deposits were too small or not rich enough to warrant extraction.

Earlier, iron had been the object of much speculation, as good deposits could be found near the surface where the soil was stripped off. But the iron mines never developed. Smelter coal was non-existent in the area and furnaces had to be operated on charcoal. Ore transport in the early days was by small but heavy mule-drawn waggons. Not only were the mines far from consuming centres, but the investors found they were hard hit by competition from the mills on Lake Ontario which benefited from the easy and cheap transport of the Great Lakes and the St. Lawrence River canals. So the iron men left.

Silent reminders of the energy of the miners are the test pits and weather-beaten mills found throughout the Haliburton Highlands. The small hamlet of Furnace Falls, some 40 miles southwest of Bancroft, was a thriving tent settlement at the time of the iron mining boom in the 1880's, but now contains less than a dozen people. Its smelter suffered a disastrous fire in 1887, and the community never fully recovered from this blow. A second deposit of ore was found about two

A loading chute still full of blasted rock from an upper level waits to discharge its load to an ore buggy on the track below.



miles to the north at Irondale by a young American engineer named Howland, but after a short experimental working, this ore proved to be too high in sulphur for profitable smelting. The final word on the mineral prospects of this area was spoken in 1959 when it was decided to tear up the railway which had opened up the region.

In 1880 a charter for the Irondale, Bancroft, & Ottawa Railway had been granted; nothing was built until Howland convinced investors he could provide traffic in ore from his iron deposits. A track 55 miles in length was finally completed, but the mines failed early in the history of the railway's construction. The line stretched from Kinmount northward, but managed to reach Bancroft only in 1911 after the company had changed ownership three times. Ottawa businessmen by that time had lost interest in the area, and there was no reason to push the line farther.

The I.B. & O. never did very well. The local people began to call it the I.O.U. because it accepted so many government subsidies and owed so much money. Around 1900 it did some business hauling out lumber and bringing in consumer goods and passengers. But when the good stands of pine were gone, there was little for the slow-moving freight train to carry as it twisted through narrow river valleys and skirted formidable granite hills. The shuffling little train grew shorter and shorter, and the line was finally absorbed by the Canadian National Railways system in 1919. Although the railway reached Bancroft, an active mining and lumber centre, there were other good rail connections from Bancroft directly south to Lake Ontario, and the I.B. & O. was thus made virtually obsolete. The unfortunate railway had a deficit of $65,000 in

This steam tractor, found rusting in the bush near Bancroft, was put in running order and driven under its own power to Lindsay. Its present owners plan to preserve it.

1958, a large amount for a line only 55 miles long. There was not much business between Bancroft and Lindsay that the railway could handle. The region is mostly a mixed farming country with a small amount of pulp cutting in southern Haliburton county. Passenger traffic dwindled to the vanishing point; mail is carried now by truck; and so the C.N.R. abandoned the track. The railway's only memorial is the deficit built up in the last years of operation and a deserted roadbed winding its way through some of the most beautiful country of the Highlands.

Another slightly mis-directed project was the building of the Monck Military Road, which was pushed through the southern part of this region in the late 1860's from Lake Simcoe to Ottawa to create a back-country route, far from the vulnerable St. Lawrence, which would provide safe passage to the capital city from Upper Canada. Named after the Governor General of British North America at the time (Sir Charles Monck), the need for this road arose during the American Civil War and its accompanying threats of possible American aggression. Immediately after the furor which arose in 1864 over the discovery that Confederate agents were using Montreal as a base for guerilla attacks on the northern states, Monck ordered the survey work started. Though the war ended in 1865, the assassination of President Lincoln and the Fenian raids in the Niagara Peninsula combined to keep the Canadians nervous. Horses and men had slashed their way through bush and blackflies to complete eight miles of road in 1866, but it was 1873 before construction was completed to the York branch of the Madawaska River at Bancroft. Here Monck's project joined a colonization road which ran eastward to Perth, then north to Ottawa. But Lord Monck's troops never used the road. By that time American relations had improved considerably, and colonization became the main function of the road. Few people now can point out where the Monck Road begins and ends; parts of it are incorporated into county roads or provincial highways; much of it appears only infrequently as a dotted line on maps.

By 1950, the Haliburton-Bancroft region had passed nearly forty years of quiet, unhurried existence when, suddenly, boom times approached again. The occurrence of radioactive minerals in the area had been known since 1922, and now the countryside was again flooded by prospectors seeking the new fortune-maker, uranium, which until about ten years ago, had been regarded as a much rarer metal than has proved to be the case. Top-grade ore is limited in its distribution, but the ore picture is complicated by the high guaranteed price that was set to ensure development of an adequate supply. This

The Irondale, Bancroft and Ottawa Railway, dismantled in 1960 by the Canadian National Railways, passes through some of the most beautiful country in the Haliburton Highlands. Here it skirts the Three Brothers Falls on Burnt River.

The village of Kinmount still operates three small lumber mills like this one situated just below the dam on Burnt River.

makes saleable as an ore much rock that would be uneconomical to process by present methods for a free market.

The enormous development of uranium mining in Ontario under the stimulus of guaranteed markets for the first years of operation has been one of the outstanding feats in the history of Canadian industry. The output of uranium started in Bancroft in 1956 when about $9.3 million worth of uranium oxide was produced; by 1959, production had rocketed to $262.9 million. All the producing companies had contracts with Eldorado Mining and Refining Company, which, acting as the agent of the Canadian government, agreed to purchase the mines' output up to a stipulated maximum.

The blow fell in November, 1959, when the U.S. government, which purchases all but a small proportion of Eldorado's products, announced that it would not take up its options on production after 1963 owing to an oversupply of fissionable products.

The Bancroft camp once again heard its death knell ringing as Dyno Mines, the second largest producer there, closed operations and dismissed its work force of 350 men only six months after the initial announcement that the U.S. contracts would not be continued. The large, multiple-levelled workings of Dyno are being left to flood, and the shaft entrances sealed with concrete. All buildings were dismantled; equipment and machinery was sold for whatever it would bring. At present, there is only one large concern still producing uranium in the Bancroft region. Grocery stores, restaurants, and service stations will, of course, be greatly affected if this last company ceases operations also. Members of Parliament have already received demands for the establishment of relief projects in the area.

It is felt by industrialists that the lull in operations will provide producers with breathing space to prepare for the increase in demand for uranium as fuel for atomic power-generating plants, likely to become more evident by 1970. Still, the Haliburton-Bancroft region will present a risk for developers. The pegmatites (or coarse-grained granitic dikes) which contain the ore are small and variable in content; investors will now hesitate before setting up large mills only to tear them down if the ore suddenly runs out. Apparently zones of greater crustal movement, of more shattering, and more mineralization and perhaps less removal of the higher rock levels by erosion must be located to provide richer bases of development.

The only other large scale production area is the Marmora iron deposit developed by the Bethlehem Steel Corporation. This iron was discovered in 1950 beneath 125 feet of limestone when an aeromagnetic survey suggested ground inspection and drilling. Mining began in 1955 following removal of about 20 million tons of the overlying limestone.

Seventy-five years ago, good timber meant good soil. Good farming country could be opened up simply by pushing roads into the virgin forest. Settlers would clear the land, sell the timber to buy equipment and stock, and then live happily ever after. Complete log houses could be erected in four days by five men; although life was difficult, it was not impossible. But the pockets of good soil were scarce here, however, and many abandoned farms mark sadly wasted effort. Now, many of these cleared tracts are being turned into Christmas tree ranches by city folk who can snap up large lots for as little as ten dollars an acre. Most of the larger operations plan to harvest their tree crop in October or the first part of November. Mechanized tree balers, powered by a small gasoline engine, have been developed to facilitate shipment. The device pulls the tree through a funnel and at the same time wraps turns of strong

cord about the tree limbs. Baled trees occupy a much smaller space in a truck, and resume their former shape quickly when the twine is removed. Favoured markets for the trees are the large cities of southern Ontario and the border States.

At the turn of the century, loggers sometimes drove timber from Haliburton as far as Trenton on the north shore of Lake Ontario, using waters of the Trent Canal system; this trip took two seasons to complete. However, most of the timber was cut into rough boards by local mills and shipped by rail to Toronto, Chicago, or Montreal. It was a common practice for American companies to buy up large tracts of standing timber, then contract local labour to cut and ship it to the United States. Lumbering is still an important industry in the area; most of the cut is in spruce, balsam, poplar, pine and maple. Recently, a giant white pine over 120 feet tall was cut by a lumbering firm near Haliburton. Measuring 48 inches across the stump and judged to be over two hundred years old, the big pine was felled in ten minutes with a chain saw. Unfortunately, the big trees are scarce now, and it is becoming increasingly difficult to sustain a supply of timber for the sawmills.

But with the completion of Highway 28 from Peterborough and Highway 35 from Lindsay, and the constant improvement of the road network surrounding the small towns of the region, it is the tourist trade that is the base of the economy. Haliburton has even been called "the summer suburb of Toronto". Many Americans from the northern states find the area attractive also, and come to fish the bountiful lakes and streams for pickerel, bass, and lake trout. Still, each summer, amateur and professional prospectors swarm over the countryside, and the people of the Highlands are quietly content in the knowledge that there really are mineral finds in their hills, and who knows, someone yet may make a good strike.

Tourism is an ever-increasing industry in the Haliburton region. The numerous lakes in the area provide ample facilities for swimming, boating, and fishing.

EDITOR'S NOTE-BOOK

W. H. van Allen (*International Ice Patrol*) was until recently the Chief of the Information Services of the Department of Transport in Ottawa. He has contributed a number of articles to the Journal in the past on various aspects of transportation, the most recent one being "Canal Systems in Canada" which was published in November 1960.

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Adelaide Leitch (*Pattern of Progress at Lac La Ronge*) is a free-lance writer and photographer who has travelled extensively in North America. She began her career as a reporter and feature writer for the *Midland Free Press* and later, the *Windsor Daily Star*. For a short period, she was managing editor of *The Atlantic Guardian*, Newfoundland.

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W. Gillies Ross (*English Harbour, Antigua*) graduated from the Royal Military College at Kingston, Ontario, and from McGill University; from the latter he obtained his M.A. in geography in 1960. His interest in English Harbour stems from his arrival there in 1953 from an Atlantic crossing on the ketch *Lystria* with seven other people. Mr. Ross has been teaching geography at Stanstead College in Quebec since 1958.

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J. L. Kirwan (*Caves in the Gatineau District of Quebec*) is a native of Ottawa, and recently graduated in geology from Carleton University. As well as being familiar with the Gatineau district in Quebec, he has done field work with a survey party of the Geological Survey of Canada in the Belcher Islands, Northwest Territories.

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J. H. G. Burke (*The Haliburton Country — Land of Promise*) obtained his B.A. Degree from the University of Toronto in 1958, and continued his studies at the Ontario College of Education. He now teaches history and geography at the Kenner Collegiate in Peterborough, Ontario.

Erratum

Vol. LXI, No. 5 (November 1960), p. 175. The builder of the "Wilderness Castle" is erroneously named as James McQuaig. The actual builder was James McOuat who came originally from Argenteuil County in Quebec.

AMONGST THE NEW BOOKS

Sverdrup's Arctic Adventures

Edited by T. C. Fairley

(Longmans, Green and Company, Toronto. 305 pp. $6.00)

Sverdrup's expedition — the Second Norwegian Expedition in the *Fram* — was remarkable for the extent of its geographical discoveries and for the high quality of its scientific results. Axel Heiberg Island and the Ellef Ringnes Islands were discovered, most of the west coast of Ellesmere Island was explored, and much detail of the little-known coasts of Jones Sound, between Ellesmere Island and Devon Island, was filled in. Once again the most famous of all polar ships proved her unique worth, as on Nansen's voyage under the same redoubtable captain following in the great traditions of Norse sailors.

The English edition of Sverdrup's account of the expedition, translated from the Norwegian by Ethel Harriet, was published in 1904 under the title: "New Land: Four Years in the Arctic Regions", and has long been out of print. The present volume, based on but abbreviated from this translation, has made its timely appearance at a time when Sverdrup's "new land" has just passed from the reconnaissance to the detailed stage of scientific investigation, and when interest in its economic possibilities is being awakened. Sverdrup's straightforward account of his party's journeys reads as freshly today as when it was written. For example, the phrase: they "fed the dogs as long as they were able to swallow" instantly recalls the atmosphere of a polar camp and a hard-won seal to all who have ever travelled with dogs. There is none of that rather stilted style and ponderous humour that sometimes marked other books of the same era. On the whole Mr. Fairley has done his work of condensation well, although one may question some of the omissions, as for example the fact that there is no mention of a visit to Greely's last camp site. On the other

hand, Peary's brief but discordant appearance on the scene is related in full, and recalls old rivalries and national pride. Occasionally Mr. Fairley's lack of first-hand familiarity with the area lets him down, as when he refers to Etah as an island, confusing the place with Littleton Island.

The subsequent story of the history of claims to the Sverdrup Islands makes most interesting reading, and is for the first time readily available in an epilogue written by Mr. Fairley. It is a story of extraordinary dilatoriness for twenty years on the part of the Norwegian government, until Sverdrup himself forced a settlement whereby he received a grant in return for recognition of Canadian sovereignty over the islands; the grant also purchased Sverdrup's records for Canada. A happy touch was added in 1957 when Superintendent H. A. Larsen, RCMP, the renowned explorer and ice pilot of Norwegian stock, was invited to represent Canada at the unveiling of the Sverdrup monument at Steinkjer.

The original comparative maps of the whole region, as it appeared immediately before and after the expedition, adequately show contemporary cartography and the discoveries of the expedition, but we would like to have seen the main journeys of the expedition plotted on modern maps. A useful biography of the latter part of Sverdrup's life is embodied in the epilogue, but we would also like to have seen short statements of the subsequent histories of the members of the expedition. The photographs, three of them modern air photographs of the region explored, are well-chosen and well-reproduced.

Mr. Fairley is to be congratulated for giving us this new edition about one of the greatest of all expeditions to the Canadian Arctic, which should be read by a wide public.

G. HATTERSLEY SMITH

Dr. Hattersley Smith is in the Geophysical Research Section of the Defence Research Board at Ottawa.

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Britain: An Official Handbook

Prepared by the Central Office of Information

(Her Majesty's Stationery Office, London, England. 584 pp. $4.50 hard-cover, $2.25 paperback)

My heart does not leap up when I behold an official handbook on my desk. It is not in the nature of things that any government should publish a balanced and lively summary of the ways of life of its own country; some gloss, a few omissions, and an anaesthetic prose, are almost inevitable. The present one is designed, we are told, "to answer questions about Britain that are most frequently asked in overseas countries". So it is to be inferred from the text that overseas curiosity often stops short. People apparently ask about the mechanism of British justice, but are not interested in criminal statistics or the divorce rate. They want to know about socialized medicine but not about the incidence of diseases. They are keen to learn about the handling of labour disputes but do not care about strike records. In this 1960 edition a new chapter deals with sports and games, but the emphasis is on organization rather than data. Maybe the authors were not aiming to satisfy so promiscuous an overseas curiosity as mine, but it is none the less necessary to warn anyone who wants an objective and statistical account of the United Kingdom that this Handbook must be supplemented with, say, Whitaker's Almanack.

These qualifications aside, the Handbook does cover a lot of ground pretty thoroughly. It begins with a 23-page synopsis on the physical and demographic background, and moves on through the following sequence of main topics: Government and Administration, Defence, Social Welfare, Housing and Planning, The Churches, Promotion of the Sciences and the Arts, the National Economy,

Industry, Transport and Communications, Labour, Finance, Trade, Broadcasting, The Press, and Sport. It has many diagrams, tables, and photographs. A fold-in map is included. The book is well produced and tastefully bound. The hardcover edition is slightly marred by an inept jacket. N. T. GRIDGEMAN

Mr. Gridgeman works in the Division of Applied Biology of the National Research Council, at Ottawa.

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Remember, Nurse
by Donalda McKillop Copeland
as told to Eugenie Louise Myles
(Ryerson Press, Toronto. 250 pp. $4.50)

Interest in the Arctic has not palled, though the last decade has produced a spate of books on its various phases. This one is by a nurse, a pioneer in the new Eskimo welfare service. She depicts the "noble savages" of Southampton Island as being at the mercy of disease.

After twenty years as a schoolteacher in Manitoba, Harold Copeland, his wife Donalda, a trained nurse, and their small daughter moved north to Hudson Bay in 1950. Mr. Copeland was not only schoolmaster but welfare officer, the first of his ilk on the big island, as his wife was its first nurse. They stayed on the

job for five years, so this book is much more than one woman's snap impressions.

It has the added virtue that Mrs. Copeland's point of view was balanced by a masculine and scholastic outlook. Neither the authoress nor her husband has any doubt of the white man's civilization being vastly superior to the Eskimos', and before long, the reader is convinced. And yet, Mr. Copeland repeats, "The farther the natives are removed from the influence of the white man, the happier they seem to be." Certainly the summer invasions of scientists and ship visits left epidemics and unrest in their wake.

Overcoming the age-old Eskimo philosophy summarized in the word "Iyonamut" — it can't be helped — was the Copelands' theme. They undertook to launch a new, opposite attitude — it CAN be helped — for which the Eskimos have no word.

"Harold's progress was as encouraging as mine was discouraging . . . I toiled in the most dismal atmospheres, the unsanitary, often filthy huts, among adult minds not only distrustful and suspicious, but unable to accept what was new."

Nurse Copeland has "remembered" well, and delineates real people. John Ell, gentle resourceful leader; Akat, brooding young hunter and Kitty his merry wife; Joe Curley, industrious half-Negro; Old Albert, a whining beggar through government generosity.

This is a most readable book. It captures the harsh beauty of the north, the courageous spirit of the people. Through Nurse Copeland's experiences, the writer weaves the mysterious hostility between interpreter Tommy and interfering Harry.

The title (taken from Tommy's frequent admonition, "Remember, Nurse, this is different.") is so cryptic that the book may be overlooked by many sincerely interested in the Arctic. And, since the geography is unfamiliar to most readers, why oh why, was not a map included?

LYN HARRINGTON

Mrs. Richard Harrington is closely associated with her husband's well-known photographic work all over the world.

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The Relationship of the Peary and Barren-Ground Caribou
by T. H. Manning

Arctic Institute of North America, Technical Paper No. 4, 52 pp. Price to members of the Institute $1.00, to non-members $2.00

To those readers who adhere to the cliché-lies, and the falsities that can be produced by statistics, this booklet is recommended. Readers who do digest the twenty-five tables and nine figures will discover that it is a detailed statistical analysis of samples from four different caribou populations. Morphological variation in the caribou populations of the Queen Elizabeth Islands, Banks Island, Dolphin and Union Strait herd and the mainland barren-ground caribou are studied by means of complex variance and covariance analyses.

The author concludes that *Rangifer pearyi* of the Arctic Islands and *Rangifer arcticus* of the mainland are conspecific and the former should be known as *R. a pearyi*. He also concludes that the Banks Island and Dolphin and Union herds are intergrades between the two subspecies. The Banks Island ones are clearly closer to *pearyi*, while the Dolphin and Union herd is more tentatively considered related to the continental *arcticus*. Manning also summarizes the historical accounts of the probable extinction of the herd which formerly migrated to Victoria Island across Dolphin and Union Strait.

A. W. F. BANFIELD

Dr. Banfild is Chief Zoologist at the National Museum of Canada at Ottawa.

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Recently Received from Publishers

The Human Use of the Earth. **By Philip Wagner. (The Free Press of Glencoe, Illinois). A synthesis of mankind's relations to his physical surroundings and an analysis of environmental conditions whether imposed on or created by the human race.**

Indian Legends of Canada. **By Ella Elizabeth Clark. (McClelland and Stewart, Limited, Toronto). A collection of legends and myths that have served to pass the long winter evenings among the Indian tribes for generations.**